



Enhancement in Image Retrieval Using Multimodal Fusion Method

Sonal W. Thakare

Student, CSIT Department

Amravati University, Maharashtra, India

Prof. M. S. Kathane

Sanmati Engineering College,

Amravati University, Maharashtra, India

Abstract: *Our main objective is to improve the performance of the image retrieval by fusing i.e. texture and visual feature for retrieving. This paper utilizes the multimodal fusion method which is the recent trend for image retrieval researches. We present the combination of text based and content based features for the image retrieval. The keywords are used for the text based search and color and texture features are used for content-based image retrieval. First the input is keyword for the image retrieve then visual features are extracted to retrieve ideal output images. For visual feature extraction we have used the calculated color co-occurrence matrix for each Red, Green and Blue component. Also we have re-ranked the image then return the list of reordered image using their visual feature. The experimental result show the performance of the both technique for the image retrieval by fusing i.e. textual and visual features and trying to narrow the semantic gap problem.*

Keyword: *Content base image retrieval, text base image retrieval, re-ranking, association rule mining,*

I. INTRODUCTION

Now a days, mostly textual metadata is used for the web based images search engines. The World-Wide Web search engines are powerful resources used for finding visual content (e.g., images, videos, etc) .When user search for image, it produces a lot of garbage in the results. Because of user usually enter that metadata i.e. data about data manually which is not sufficient, and it is difficult to capture every word in the keyword that describes the image. There are many image capturing devices are available such as digital camera, scanner etc. The problem is not finding information, but how to find useful information efficiently and effectively. The image mining is the combination of data mining and image processing. It is deals with the extraction feature of image from the large collection images. In the data mining the Association rule is the important branch. [5] It will discover the association and relation among the large data set. Our main aim is to design system using fusion method with re-ranking. There is the problem of “semantic gap” i.e. translation of high-level user perceptions into low-level image features of Content Based Image Retrieval (CBIR) systems, proposed method trying to narrow this problem and enhance the image retrieval performance by fusing i.e. textual and visual features for retrieving image. The paper present two step for retrieve an image. First, keywords are used to search the image and in second step visual features like color and texture are extracted.

II. LITERATURE REVIEW

Raniah A. Alghamdi [1] proposed method that utilizes the fusion of the images’ multimodal information (textual and visual) .It combines two different data mining techniques to retrieve semantically related images: clustering and association rules mining algorithm. At the offline phase the semantic association rules mining is constructed then the association rules are discovered between the text semantic clusters and the visual clusters of the images to use and the result of this is used in online phase .

In [2] proposed method attempts to provide a comprehensive survey of the recent technical achievements in high-level semantic-based image retrieval. In this there is recent survey covering the area including low level image features extraction, similarity measurement, and deriving high-level semantic features. The proposed method identify five major categories of the state-of-the-art techniques in narrowing down the ‘semantic gap’: (1) using object ontology to define high-level concepts; (2) using machine learning methods to associate low-level features with query concepts; (3) using relevance feedback to learn users’ intention; (4) generating semantic template to support high-level image retrieval; (5) fusing the evidences from HTML text and the visual content of images for WWW image retrieval.

In [3], a Web application called MM Retrieval is proposed. It has an online graphical user interface system that brings image and text search together to compose a multimodal and multilingual query. The modalities are searched in parallel, and then the results can be fused via several selectable methods. Fusion process consists of two components: score normalization and combination while method deals with the clusters of the modalities, proposed a method that constructs a semantic relation between text (words) and visual clusters using the ARM algorithm. For searching, image retrieval and image re-ranging the large amount of work is done in the image database. The diverse and scattered work in this domain needs to be collected and organized for easy and quick reference. This techniques are trying to narrow the semantic gap problem.

In paper [4] present a brief idea of various image retrieval techniques and re-ranking algorithm. It gives detailed information through the core architecture of image harvesting and retrieval system to the different Re-ranking techniques. These techniques are discussed in terms of approaches, methodologies and findings images from large database.

Data mining is a technique to process data, select it, integrate it and retrieve some useful information It discovers the useful information from large amount of relational databases. It can perform these various activities using its technique like clustering, classification, prediction, association learning etc. It will discover the association and relation among the large data set.[5]

In[6] many algorithms for generating association rules were presented over time. Different types of mining techniques explained. This paper represents comparison of five association rule mining algorithms: AIS, SETM, Apriori, AprioriTID and Apriori Hybrid . The AprioriTID and Apriori Hybrid have been proposed to solve the problem of Apriori algorithm. From the comparison they conclude that the Apriori Hybrid is better than Apriori and AprioriTID because it reduces overall speed and improves the accuracy.

III. PROPOSED WORK

To extract the visual feature of images is difficult task and presentation of high level visual concept and low level concept there is the problem of semantic gap. In order to overcome these problem in the proposed system used the combination of text base and content base image retrieval, To compare text base image retrieval with content base image retrieval the feature extraction is required. Retrieve image in text base take advantage of keywords or metadata such as caption, textual description and authors, where content base image retrieval is complicated to extract the visual features such as color, shape, texture. So the proposed system trying to narrow the semantic gap .problem and enhance the performance of texture and visual features for retrieving images by using fusion method with re-ranking Proposed system works in two phases which are as follows:

A. Pre Processing Phase(offline phase)

In this phase images in the dataset are provided to the system. For each image system evaluate feature like color, texture, shape and distance in between the neighbor clusters and then store the results of each image in the database. All the calculated images are stored in database.

B. Image retrieval Phase(online phase)

In this phase the features of image which are calculated in the previous phase and pass as input to the system. Then the features are compared with the features of image which are already stored in the database. Image whose features matches exactly is stored with high priority and other image whose features are related closely is stored with low priority. Final results are then displayed to the user from high priority images to the lower priority images. And all the images are re-rank matching content feature.

IV. PERFORMANCE MEASUREMENT

For measuring the performance of system many different methods have been created and used by researchers. Here we have used the evaluation methods namely, Precision and Recall. Precision is the ratio of relevant retrieved images to the total number of retrieved images. Recall is the ratio of relevant retrieved images to the total number of relevant images in the database, the following formulae are used for finding Precision and Recall values[8].

$$\text{Precision} = \frac{\text{No. of relevant images retrieved}}{\text{Total no. of images retrieved}}$$

$$\text{Recall} = \frac{\text{No.of relevant retrieve images}}{\text{Total no. of relevant images in database}}$$

V. RESULTS AND DISCUSSION

The proposed method has been implemented using advance Java and tested on database containing images having different categories of images like Flower, Car, Butterfly, Fruit and Animal. The following table show comparison of the result analysis with respect to time by proposed algorithm.

Table I Comparison of result analysis with respect to time

Category	Text query	No. of Retrieval Images	Precision	Recall	Propose Method Retrieval Time
Flower	Rose	15	0.75	0.37	0.12s
Butterfly	Flying butterfly	25	0.89	0.71	0.25s
Fruit	Apple	35	0.87	0.70	0.30s

VI. CONCLUSION

The proposed paper utilizes the fusion of the images' multimodal information (textual and visual) for retrieving image. The proposed method has two step first, the text base search using some keyword second some content of image are used to retrieve image. This proposed method trying to enhance the performance and narrow the semantic gap problem of image retrieval. The experimental result shows trying to improve accuracy and speed.

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