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FUSION METHOD BASED ON ASSOCIATION RULES MINING FOR IMAGE RETRIEVAL

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Abstract: The retrieving method proposed in this paper utilizes the fusion of the images' multimodal information (textual and visual) which is a recent trend in image retrieval researches. It combines the techniques like association rule mining, SVM classifier and saliency map detection for retrieving semantically related images. Textual metadata is inefficient, expensive and may not capture every keyword that describes the image. On the other hand, the Content Based Image Retrieval (CBIR) systems can filter images based on their visual contents such as shapes, colors, textures or any other information that can be derived from the image itself which may provide better indexing and return more accurate results It requires the translation of high-level user perceptions into low-level image features and this is the so-called "semantic gap" problem. So in this proposed m trying to enhance the image retrieval performance by fusing i.e. textual and visual features for retrieving and narrow the semantic gap problem.

Keywords: CBIR, Association rule, SVM, Image Retrieval

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INTRODUCTION

Image mining denotes combination of data mining and image processing technology to aid in the analysis and understanding in an image-rich domain. Clearly, image mining is different from computer vision and image processing techniques. This is because the focus of image mining is in the extraction of patterns from a large collection of images, whereas the focus of computer vision and image processing techniques is in understanding and/or extracting specific features from a single image.

Currently, most Web based images search engines rely purely on textual metadata. That produces a lot of garbage in the results because users usually enter that metadata manually which is inefficient, expensive and may not capture every keyword that describes the image. On the other hand, the Content Based Image Retrieval (CBIR) systems can filter images based on their visual contents such as colors, shapes, textures or any other information that can be derived from the image itself which may provide better indexing and return more accurate results. At the same time, these visual features contents extracted by the computer may be different from the image contents that people understand. It requires the translation of high-level user perceptions into low-level image features and this is the so-called “semantic gap” problem. This problem is the reason behind why the CBIR systems are not widely used for retrieving Web images. A lot of efforts have been made to bridge this gap by using different techniques.

The purpose of image mining techniques is discovering meaningful correlations and formulations from previously collected image data.

Proposed work present a framework for retrieving images based on fusion of the images’ multimodal information (textual and visual) which is a recent trend in image retrieval researches. The method gives the ability to retrieve images that are semantically related by using the extracted visual features of the query image and by exploring the related ARs from the mining. So based on textual as well as visual appearance images are retrieved by using concept of saliency map algorithm which is well define algorithm for object detection and feature extraction. Multimodal functionality is divided into three, low level features extraction, late fusion and trans-media fusion. Low level feature means texture, color etc, late fusion strategy is implemented by SVM .The standard classification technique Support Vector Machines (SVM) is used to perform the classification on the selected features using saliency information and in trans media fusion strategy image with labeled text is evaluated based on factor like area, major axis, minor axis etc.

LITERATURE REVIEW

Techniques proposed in [11] were not generally based on visual features but on the textual annotation of images. In other words, images were first annotated with text and then search using text based approach from traditional database management system. Text based image retrieval system uses traditional database techniques to manage images [2].Obviously, annotating images manually is a cumbersome as an expensive task for large image databases, and is often subjective, context sensitive and incomplete[8][9]. As a result it is difficult for traditional text based method to support variety of task dependant queries. Numerous researches have been carried on this image mining. Literature paper presents a survey on various image mining techniques that were proposed earlier. Developments in area of image acquisition and storage technique have shown the way for incredible growth in extensively large and detailed image databases [3]. The images which are available in these databases, if examined, can provide valuable information to the human users. Image mining facilitates the extraction of hidden information, image data association, or other patterns not clearly accumulated in the images [6][10]. Image mining is an interdisciplinary effort that provides significant application in the domain of machine learning, image processing, image retrieval, data mining, database, computer vision, and artificial intelligence [4][5]. Sanjay et al. (2007) put forth an image mining technique using wavelet transform. The author proposed an image mining approach using wavelet transform. It uses common pattern identical, pattern identification and data mining models with the intention that a real life scene/image can be associated to a particular category, assisting in different prediction and forecasting mechanisms. It is a three-step procedure i.e. image gathering, learning and classification. Since wavelet transform uses time frequency association, it can be utilized for image mining as a substitute of Fourier transform [7]. The conception of image mining as a consequence can be competently used for weather forecasting so that one can know the natural disasters that may occur in advance.

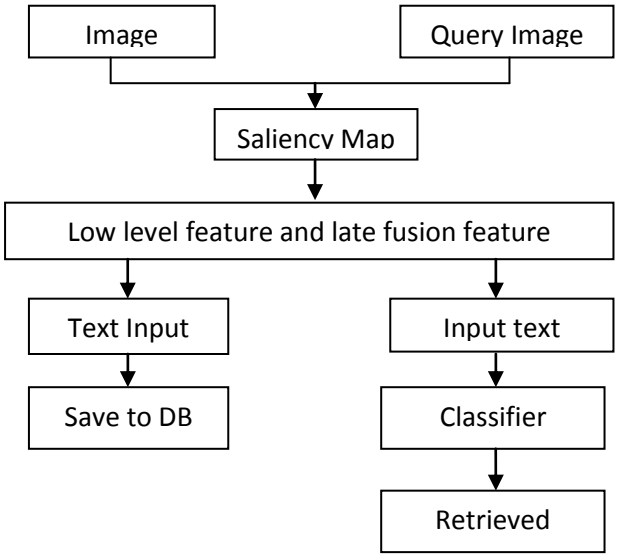
In the late fusion, the extracted features of each modality are classified using the appropriate classifier then each classifier provides the decision. Late fusion was used widely in image retrieval systems and there is diversity in the proposed methods. In [12], a Web application called MMRetrieval 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 [13] method deals with the clusters of the modalities, [14] proposed a method that

constructs a semantic relation between text (words) and visual clusters using the ARM algorithm.

The method proposed in [1] is a Multimodal Fusion method based on Association Rules mining (MFAR). It is considered as a late fusion. This method combines two different data mining techniques for retrieving: clustering and association rules mining (ARM) algorithm. It uses ARM algorithm to explore the relations between text semantic clusters and image visual features clusters. The method gives the ability to retrieve images that are semantically related by using the extracted visual features of the query image and by exploring the related ARs from the mining. The results show that the precision value of MFAR is better than MMRetrieval system and the system without association. The method proposed in [15] is a methodology that encapsulates K-Means Clustering with Saliency map detection technique to determine salient region in images using low-level features of luminance and color and then extract the features. Method proposed in [16] for saliency map consists of four basic steps. First, method decomposes a given image into compact, perceptually homogeneous elements that abstract unnecessary detail. Based on this abstraction it computes two measures of contrast that rate the uniqueness and the spatial distribution of these elements. From the element contrast it then derive a saliency measure that produces a pixel-accurate saliency map which uniformly covers the objects of interest and consistently separates fore- and background. [17] Gives Review of Image Classification Techniques in Content Based Image Retrieval. Working of support vector machine (SVM) and other proposed techniques for image retrieval are described in [18].

PROPOSED WORK

Proposed method trying to improve accuracy, less memory space and fast speed as compare to MFAR Proposed in [11].Input image is processed and saliency map of image is generated then low level features are extracted like color map etc and by giving caption is saved to database. For retrieval of image, input image is given then its features are extracted and compare with saved images based on features and caption and by using SVM classifier images are classified and by re-ranking images are retrieved. Data flow diagram of proposed work is as follows:



CONCLUSION

The retrieving method proposed in this paper utilizes the fusion of the images' multimodal information (textual and visual) which is a recent trend in image retrieval researches for retrieving image, proposed method trying to enhance the image retrieval performance and narrow the semantic gap problem. The proposed method is trying to improve accuracy and speed.

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