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A Review on Personalized Tag based Image based Search Engines

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Abstract:- The development of social media based on Web 2.0, amounts of images and videos spring up everywhere on the Internet. This phenomenon has brought great challenges to multimedia storage, indexing and retrieval. Generally speaking, tag-based image search is more commonly used in social media than content based image retrieval and content understanding. Thanks to the low relevance and diversity performance of initial retrieval results, the ranking problem in the tag-based image retrieval has gained researchers' wide attention. We will review some of techniques proposed by different authors for image retrieval in this paper.

Keywords: Search Engine, Clustering, Affinity Propogation

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I. INTRODUCTION

Search engine requirement is increasing day by day. Some persons are unable to specify correct query while searching images. Due to ambiguous query, proper result will not fetch from dataset. Hence there is no necessary that the user will get satisfied with the displayed result set. If user is not a technical person, he will get frustration about search engine and his interest towards search engine will be reduced. Therefore to provide most relevant result, we propose a personalized search engine. In this search engine, the specified query will be modified using user's preferences and profile. The modified query will be used to fetch data from database. After that the data will categorized into communities. For community detection we use Affinity propagation clustering algorithm. After categorization, the images will be re-ranked within the communities.

II. LITRATURE SURVEY

Social media sharing websites allow users to annotate images with free tags, which significantly contribute to the development of the web image retrieval. Tag-based image search is an important method to find images shared by users in social networks. However, how to make the top ranked result relevant and with diversity is challenging. In this paper, we propose a topic diverse ranking approach for tag-based image retrieval with the consideration of promoting the topic coverage performance. First, we construct a tag graph based on the similarity between each tag. Then community detection method is conducted to mine the topic community of each tag. After that, inter-community and intra-community ranking are introduced to obtain the final retrieved results. In the inter-community ranking process, an adaptive random walk model is employed to rank the community based on the multi-information of each topic community. Besides, we build an inverted index structure for images to accelerate the searching process. Experimental results on Flickr dataset and NUS-Wide datasets show the effectiveness of the proposed approach.

1. **Image Re-ranking based on Topic Diversity**[1]
    Author: Xueming Qian, Smiles Laboratory, School of Electronics and Information Engineering, Xi'an Jiaotong University, Xi'an, China
    Publication: IEEE Transactions on Multimedia (Volume: 19, Issue: 4, April 2017)
    Locations of images have been widely used in many application scenarios for large geotagged image corpora. As to images that are not geographically tagged, we estimate their locations with the help of the large geotagged image set by content-based image retrieval. Bag-of-words image representation has been utilized widely. However, the individual visual word-based image retrieval approach is not effective in expressing the salient relationships of image region. In this paper, we present an image location estimation approach by multisaliency enhancement. We first extract region-of-interests (ROIs) by mean-shift clustering on the visual words and salient map of the image based on which we further determine the importance of the ROI. Then, we describe each ROI by the spatial descriptors of visual words. Finally, region-based visual phrases are generated to further enhance the saliency in image location estimation. Experiments show the effectiveness of our proposed approach.

2. **Image Location Inference by Multisaliency Enhancement**[2]
    Author : Dong Liu, School of Computer Sci.& Tec., Harbin Institute of Technology, China
    Publication: Multimedia and Expo, 2009. ICME 2009.
    Social media sharing web sites like Flickr allow users to annotate images with free tags, which greatly facilitate social image search and browsing. However, currently

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tag-based image search on Flickr does not provide the option of relevance-based ranking, i.e., the search results cannot be ranked according to their relevance levels with respect to the query tag, and this has limited the effectiveness of tagbased search. In this paper, we propose a 5 relevance-based ranking scheme for social image search, aiming to automatically rank images according to their relevance to the query tag. It integrates both the visual consistency between images and the semantic correlation between tags in a unified optimization framework. We propose an iterative method to solve the optimization problem, and the relevancebased ranking can thus be accomplished. Experimental results on real Flickr image collection demonstrate the effectiveness of the proposed approach.

3. **Boost search relevance for tag-based social image retrieval**[3]
   Author : Dong Liu, School of Computer Sci.& Tec., Harbin Institute of Technology, China
   Publication: Multimedia and Expo, 2009. ICME 2009.
   Social media sharing web sites like Flickr allow users to annotate images with free tags, which greatly facilitate social image search and browsing. However, currently tag-based image search on Flickr does not provide the option of relevance-based ranking, i.e., the search results cannot be ranked according to their relevance levels with respect to the query tag, and this has limited the effectiveness of tagbased search. In this paper, we propose a relevance-based ranking scheme for social image search, aiming to automatically rank images according to their relevance to the query tag. It integrates both the visual consistency between images and the semantic correlation between tags in a unified optimization framework. We propose an iterative method to solve the optimization problem, and the relevancebased ranking can thus be accomplished. Experimental results on real Flickr image collection demonstrate the effectiveness of the proposed approach.

4. **Towards a Relevant and Diverse Search of Social Images**[4]
   Author: Meng Wang, Internet Media Group, Microsoft Research Asia, Beijing, Beijing
   Publication: IEEE Transactions on Multimedia (Volume: 12, Issue: 8, Dec. 2010)
   Recent years have witnessed the great success of social media websites. Tag-based image search is an important approach to accessing the image content on these websites. However, the existing ranking methods for tag-based image search frequently return results that are irrelevant or not diverse. This paper proposes a diverse relevance ranking scheme that is able to take relevance and diversity into account by exploring the content of images and their associated tags. First, it estimates the

relevance scores of images with respect to the query term based on both the visual information of images and the semantic information of associated tags. Then, we estimate the semantic similarities of social images based on their tags. Based on the relevance scores and the similarities, the ranking list is generated by a greedy ordering algorithm which optimizes average diverse precision, a novel measure that is extended from the conventional average precision. Comprehensive experiments and user studies demonstrate the effectiveness of the approach. We also apply the scheme for web image search reranking, and it is shown that the diversity of search results can be enhanced while maintaining a comparable level of relevance.

5. **The Google Similarity Distance**[5]
   Author: Rudi L. Cilibrasi, CWI, Amsterdam
   Publication: IEEE Transactions on Knowledge and Data Engineering (Volume: 19, Issue: 3, March 2007)
   Words and phrases acquire meaning from the way they are used in society, from their relative semantics to other words and phrases. For computers, the equivalent of "society" is "database," and the equivalent of "use" is "a way to search the database". We present a new theory of similarity between words and phrases based on information distance and Kolmogorov complexity. To fix thoughts, we use the World Wide Web (WWW) as the database, and Google as the search engine. The method is also applicable to other search engines and databases. This theory is then applied to construct a method to automatically extract similarity, the Google similarity distance, of words and phrases from the WWW using Google page counts. The WWW is the largest database on earth, and the context information entered by millions of independent users averages out to provide automatic semantics of useful quality. We give applications in hierarchical clustering, classification, and language translation. We give examples to distinguish between colors and numbers, cluster names of paintings by 17th century Dutch masters and names of books by English novelists, the ability to understand emergencies and primes, and we demonstrate the ability to do a simple automatic English-Spanish translation. Finally, we use the WordNet database as an objective baseline against which to judge the performance of our method. We conduct a massive randomized trial in binary classification using support vector machines to learn categories based on our Google distance, resulting in an a mean agreement of 87 percent with the expert crafted WordNet categories.

6. **Defining the Dynamicity and Diversity of Text Collections**[6]
   Author: Ilya Markov, Fabio Crestani, Faculty of InformaticsUniversity of Lugano Lugano Switzerland

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Publication: SIGIR- Special Interest Group on Information Retrieval

In Information Retrieval collections are often considered to be relatively dynamic or diverse, but no general definition has been given for these notions and no actual measure has been proposed to quantify them. We give intuitive definitions of the dynamicity and diversity properties of text collections and present measures for calculating them based on the notion of novelty. Experimental results show that the proposed measures are consistent with the definitions and can distinguish collections effectively according to their dynamicity and diversity properties.

7. **Relevancy tag ranking**[7]
   Author: Garima Agrawal, Rashmi Chaudhary, Computer Science and Engineering, Madan Mohan Malaviya Engineering College, Gorakhpur, India
   Publication: Computer and Communication Technology (ICCCT)

   Tags are metadata which helps describe the visual content of an image that makes browsing easier by better organization. Recent boom of Social Media sharing Websites has popularized tagging among a large pool of users by facilitating sharing and embedding of personal photographs. Inappropriate and Random tagging has come out of the blue as a major drawback of personalized tagging limiting the effectiveness of their search and retrieval. In this paper, we propose a tag indexing scheme, which helps to rank the tags of an image according to their pertinence with image content. We first segment the image, calculate the size of segmented objects, and continue parsing for object identification. Then we perform the Probabilistic density estimation and finally couple it with social image retrieval approaches to improve its effectiveness. This tag ranking approach significantly hikes up the performance of tag based image search and retrieval.

8. **Image retrieval via improved relevance ranking**[8]
   Author: Lingling Chen, School of Automatic, Nanjing University of Post and Telecommunications, China
   Publication: Control Conference (CCC), 2014

   Recent years have witnessed the success of many online social media websites. Social images are usually associated with user-provided descriptors called tags, and thus tag-based search can be easily accomplished by using the descriptors as index terms. However, the existing methods frequently return results that are irrelevant or noisy with low-quality. It is argued that the relevance and quality are two important measures for a user friendly summarizing the returned images. In this paper, we propose a relevance-quality ranking method considering both image relevance and image quality. First, a relevance-based ranking scheme is utilized 8 to

automatically rank images according to their relevance to the query tag, which reckons the relevance scores based on both the visual similarity of images and the semantic consistency of associated tags. Then, quality scores are added to the candidate ranking list to accomplish the relevance-quality based ranking. Experimental results on NUS-WIDE image collection demonstrate the effectiveness of the proposed approach.

9. **Tag-Based Image Retrieval Improved by Augmented Features and Group-Based Refinement**[9]
   Author: Lin Chen, Nanyang Technological University, Centre for Multimedia and Network Technology (CeMNet), School of Computer Engineering, Singapore Dong Xu, School of Computer Engineering, Nanyang Technological University, Singapore
   Publication: IEEE Transactions on Multimedia (Volume: 14, Issue: 4, Aug. 2012)

   In this paper, i propose a new tag-based image retrieval framework to improve the retrieval performance of a group of related personal images captured by the same user within a short period of an event by leveraging millions of training web images and their associated rich textual descriptions. For any given query tag (e.g., "car"), the inverted file method is employed to automatically determine the relevant training web images that are associated with the query tag and the irrelevant training web images that are not associated with the query tag. Using these relevant and irrelevant web images as positive and negative training data respectively, we propose a new classification method called support vector machine (SVM) with augmented features (AFSVM) to learn an adapted classifier by leveraging the prelearned SVM classifiers of popular tags that are associated with a large number of relevant training web images. Treating the decision values of one group of test photos from AFSVM classifiers as the initial relevance scores, in the subsequent group-based refinement process, we propose to use the Laplacian regularized least squares method to further refine the relevance scores of test photos by utilizing the visual similarity of the images within the group. Based on the refined relevance scores, our proposed framework can be readily applied to tag-based image retrieval for a group of raw consumer photos without any textual descriptions or a group of Flickr photos with noisy tags. Moreover, we propose a new method to better calculate the relevance scores for Flickr photos. Extensive experiments on two datasets demonstrate the effectiveness of our framework.

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10. **Large-Scale Duplicate Detection for Web Image Search**[10]

Author: Bin Wang, University of Science and Technology of China, Hefei 230026, China

Zhiwei Li, Microsoft Research Asia, 49 Zhichun Road, Beijing 100080, China

Publication: Multimedia and Expo, 2006 IEEE International Conference

Finding visually identical images in large image collections is important for many applications such as intelligence propriety protection and search result presentation. Several algorithms have been reported in the literature, but they are not suitable for large image collections. In this paper, a novel algorithm is proposed to handle the situation, in which each image is compactly represented by a hash code. To detect duplicate images, only the hash codes are required. In addition, a very efficient search method is implemented to quickly group images with similar hash codes for fast detection. The experiments show that our algorithm can be both efficient and effective for duplicate detection in Web image search.

III.   CONCLUSION

Social media sharing websites allow users to annotate images with free tags, which significantly contribute to the development of the web image retrieval. Tag-based image search is an important method to find images shared by users in social networks. However, how to make the top ranked result relevant and with diversity is challenging. In this paper we have reviewed different techniques and algorithms used by different authors and have reached to conclusion that image based search engine can be improved by using new clustering techniques and can be tested via Google online dataset.

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