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Relevance and Diversity of Images by Using Tags

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Abstract **- Now a day, there is a growth of digital images and video archives. Some of these are very important from user point of view. The collection of these digital images may be for personal use and may be for public use. For searching images in the database, there is the need of secure, fast and efficient techniques. Tag-based image search is an effective technique to find images in the databases and in the social websites. In this paper a reranking system for image retrieval with the consideration of images relevance and diversity is proposed. Reranking of the images have done according to their visual features and semantic features. Visual features are used for detecting duplicate images in proposed method. Each user maintains several images. First sort these images by same group user ranking system. Users that have higher contribution to the given query rank higher. Then an implementation to all-user reranking on the ranked users image set and only the most relevant image from users image set is selected. These selected images compose the final retrieval results. We build an inverted structure for the image dataset to speed up the searching process.**

Keywords **: Diversity, feature extraction, relevance, reranking, tag based images etc**

I. INTRODUCTION

The Web has emerged as a rich source of images. Billions of images and videos are hosted publicly on the web. The number of digital images over the Web is growing by each passing day, indexing this image data based on text is problematic Most image search tools in operation today depend on keyword meta-tags, where an image or video is annotated with a limited number of words that are either provided manually, or else they are taken from the text occurs nearby in its specific document. Most people find images on the Web by querying an image search engine. Google collects images from the Web and tags them with the words that appear in their area on the crawled HTML documents and links. Generally systems move towards image retrieval by analyzing images in terms of visual properties such as colour and texture.

Tag Based Image Retrieval retrieves images based on the tags/keywords present in tag-based image search is an important approach to access the image content on the websites. However, the existing ranking methods for tag-based image search frequently return results that are unrelated or lack of diversity. This paper presents a diverse relevance ranking scheme which concurrently takes relevance and diversity into account by checking the content of images and their associated tags. First, it calcultes the relevance scores of images for the query term based on both visual information of images and semantic information of associated tags. Then semantic resembelence of social images are calculated based on their tags. The social tagging is foreseen as a method to connect the semantic gap in image analysis. Tag-based search, which returns images annotated with a specific query tag is a very specific way of searching or surfing images on social database. This image search method, to some extent, has reached some success on exploiting the associated tags for indexing and searching large-scale web images compared with text-based image search and content-based image search. The relevance of a tag given the visual content can be personal for a particular user, an impartial benchmark is desirable for general-purpose search and visual content understanding. Tag-based image search is used in social media than content based image retrieval and context-and-content based image retrieval.

In recent years, the re-ranking problem in the tag-based image retrieval has obtained researchers' attention. Yhis paper proposes a social re-ranking algorithm which user information is firstly introduced into the traditional ranking method taking the semantics, social clues and visual information of images. The presentations of this paper can be described as follows:

a. A tag-based image search approach with social re-ranking. used the visual information, social user's information and image view times to increase the diversity performance of the search result.
b. Inter user ranking is applied to rank users images according to the given query. With this ranking the system get the good trade-off between the diversity and relevance performance which also effectively eliminate the similar images from the same user in a ranked result.
c. Title and time stamp ranking in which the desired output will get on the basis of title information andthe recent time stamp which boost the diversity performance of image ranking system.
d. The view of an image in social media community is an important feature which indicates the click count of this image. The number of click count has been utilized to improve the relevance performance of the image retrieval results.

Tag Processing Strategy

It has been long acknowledged that tag ranking and refinement play an important role in the re-ranking of tag-based image retrieval, for they lay a firm foundation on the development of re-ranking in tag based image retrieval (TBIR).

Relevance Ranking Approach

To directly rank the raw photos without undergoing any intermediate tag processing.Content-Based image retrieval uses multiple image descriptors related to colour and texture from the images and, the application returns a set of images that are more relevant to the users' query, and rank the images. It displays the most similar images on screen, after which the user give feedback about the relevancy of the returned images to the application. In the era of Internet, web search has become integrated part of peoples life for any kind of information. Along with the text based search, image based search and image search is gaining popularity. Search engines like Google and Bing now a day provide dedicated image search options. One of the problems of these search options is that the images are searched mainly based on the associated textual tags and with a very limited image based features, where image search using popular web engines return inappropriate results. To address this problem, a novel search algorithm for the images available in the web is proposed. Web-based image search are become necessary in human life for many activates for preparing Presentation, Project Report, Quiz preparation, Web Design etc. There are two ways in general to receive an Image, the first one is based on the tags which are related / posted with the image and another one is Content Based Image retrieval where user has to give a input image and the input image visual features are extracted and compared with visual features of Database images then the images which are having similar features are retrieved and displayed to the user. Many of the researches are accepted by using the Web Image Re-Ranking but it gives some difficulties to retrieve the requested images from the Web, then the problem is defined in the problem statement. Image Search faces two problems most of the time required images are not displayed in search result and while using a CBIR technique it consume more time to produce the result .There are many image portals like flicker[15], shutter stock, iPhotostock, etc. in a day thousands of images are uploaded and keep increasing. These portals need a powerful Image Search Engine otherwise the user will lose their interest in image searching.

II. RELATED WORK

TARerank, to refine text-based image search results. This paper shows a reranking model by optimizing a criterion related to reranking performance in terms of both relevance and diversity in one stage simultaneously. NCTC is proposed to quantify the hierarchical TC. Compared with the two-step optimization in other diversified reranking methods, TARerank can achieve the joint optimum of improving relevance and diversity [1].An embedding method, FAemb, can be seen as the generalization of several well-known embedding methods such as VLAD, TLCC, and VLAT in order to speed up the embedding process. in image search context[2].A novel image search re-ranking approach, named spectral clustering re-ranking with click-based similarity and typicality (SCCST) is a re-ranking scheme. Click information is fully adopted to guide the image similarity learning and image typicality learning. With the detection of click-based triplets a novel image similarity measurement, named click-based multi-feature similarity learning (CMSL), which integrates multiple kernel learning into metric learning to learn similarity measure for each feature in a unified space. The final re-rank list is obtained by calculating clusters typicality and within-clusters image typicality in descending order[3].The HRPP algorithm transforms the original visual features space into an intrinsically low-dimensional space by preserving the manifold structure and relevance relationship among the images. The H-Rank algorithm sorts the images with their distances to the hyper sphere centre [4].The fine-grained image search incorporates semantic attributes into the inverted index, leading to an efficient search engine which produces promising search results in large-scale experiments [5]. A semi supervised Hashing approach via kernel hyper plane learning for scalable image search is analyzed. In this method a combination of MKL with fuse multiple types of features for generating better hashing codes is used. Each hashing function is updated independently in each iteration. Moreover, this method is also applicable for video retrieval by using the video key frames as the input[6].A novel codebook-free image search algorithm, a scalable cascaded hashing scheme for local feature quantization which first ensures the matching recall rate, followed by a verification step using compact binary signatures to remove false positive matches. Therefore, this method achieves a balanced recall and precision for the feature matching. This algorithm is a good fit to mobile phone based image search [7]. Spatial context information with a binary code is the multimode property to improve the retrieval performance [8].Leverage click session information and image visual information to understand user image-search goals [9].iLike, a vertical search engine for apparel shopping is used to integrate textual and visual features for better search performance. Representation of text terms in the visual feature space, and developed a text-guided weighting scheme for visual features. Such weighting scheme infers user intention from query terms, and enhances the visual features that are significant toward such intention. In some cases, it does not work well for some keywords .Many of such words have abstract meaning and are unlikely to be included in queries. To sum up, by combining textual and visual features, iLike manages to pick “good” features that reflect users’ perception, and therefore is effective for vertical search [10].MSIDX is a promising indexing scheme, which analyzes the image content according to the value cardinalities that appear on the dimensions of the respective descriptor vectors. MSIDX

is capable of performing accurate content-based retrieval in low search time and handles the dynamic operations of insertions and deletions in real-time [11].Feasibility and efficacy of learning query-specific distance functions for large-scale Web image search. One way to improve query-specific distance functions is to allow related text-queries to "share" the learned distance functions. Sharing distance functions also reduces the number of distance functions that need to be cached by the retrieval system. .Specific distance functions can improve ranking accuracy in certain query categories more than others the ability to automatically select queries or query categories that are suitable for such distance functions would be beneficial. One possible approach is to measure the disagreement between the co-click statistics and the visual similarity produced by using un-weighted Euclidean distance, and use such disagreement as an indication of whether query-specific distance can be useful[12].Re-ranking can be Made by considering click-based relevance feedback, by exploring the use of click through data and the fusion of multiple modalities. After assigning a specific kernel to each modality, multiple modalities of images are loaded into the simple MKL ensembles. Based on a gradient method, a proper combination of modality weights is learnt adaptively and query dependently. Performance improvement using click-based relevance feedback re-ranking approach is observed in most query types[13]. BoW model and embedding methods, proposed image search scheme by the issue of memory usage. The inverted table, whose size is closely related to the number of local descriptors and the length of embedding code, cannot be fitted into memory [14].Flickr is an image hosting and video hosting website and web services suite that was created by Ludicorp in 2004 and acquired by Yahoo on March 20, 2005. In addition to being a popular website for users to share and embed personal photographs, and effectively an online community, the service is widely used by photo researchers and by bloggers to host images that they embed in blogs and social media. The Verge reported in March 2013 that Flickr had a total of 87 million registered members and more than 3.5 million new images uploaded daily. In August 2011 the site reported that it was hosting more than 6 billion images and this number continues to grow steadily according to reporting sources. Photos and videos can be accessed from Flickr without the need to register an account but an account must be made in order to upload content onto the website. Registering an account also allows users to create a profile page containing photos and videos that the user has uploaded and also grants the ability to add another Flickr user as a contact [15]. A tag ranking scheme, aiming to automatically rank the tags associated with a given image according to their relevance to the image content. They first estimate initial relevance scores for the tags based on probability density estimation, and then perform a random walk over a tag similarity graph to refine the relevance scores [16].If different persons label similar images using the same tags, these tags are likely to reflect objective aspects of the visual content. Starting from this intuition, a novel algorithm that scalable and reliably learns tag relevance by accumulating votes from visually similar neighbours. Further, treated as tag frequency, learned tag relevance is seamlessly embedded into current tag-based social image retrieval paradigms [17].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 [18]. A diverse relevance ranking scheme which is able to simultaneously take relevance and diversity into account. It takes advantage of both 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. With the relevance scores and the similarities, the ranking list is generated. [19]

III. EXISTING SYSTEM

User cannot accurately describe their request with single words and tag proposal system always recommend words that are highly simultaneous to the existing tag set, thus add little information to a users' contribution. Besides, polysemy and synonyms are the other causes of the query uncertainty. The existing approaches highly rely on the visual and semantic information, and thus ignore the social clues such as user and view information. A fundamental problem in the re-ranking of the tag-based social image retrieval solves these problems.

Disadvantages

Nonetheless, the following challenges block the path for the development of re-ranking technologies in the tag-based image retrieval.

Tag mismatch.

Social tagging requires all the users in the social network to label their uploaded images with their own keywords and share with others.

Image annotation, there is no predefined ontology or taxonomy in social image tagging.

Every user has their own habit to tag images.

IV. PROPOSED SYSTEM

To achieve relevance score of each image a new iterative algorithm to obtain the relevance score is proposed. Discussions about weight selection and image features in the regularization framework are complement to each other.In order to find an optimal number of representative images which are selected from each user's image set, many new comparison experiments and comprehensive discussions are added. Proposed a tag ranking method to rank the tags of a given image, in which probability density estimation is used to get the initial relevance scores and a random walk is proposed to refine these scores over a tag similarity graph. Proposed to learn the relevance of tags by

visually weighted neighbour voting, a variant of the popular baseline neighbour voting algorithm.

Advantages

Tag-based image search is an important method to find images contributed by social users in such social websites. However, how to make the top ranked result relevant and with diversity is challenging. In this paper, we propose a social re-ranking system for tag-based image retrieval with the consideration of image's relevance and diversity. We aim at re-ranking images according to their visual information, semantic information and social clues. The initial results include images contributed by different social users. Usually each user contributes several images.

System Architecture

Digital image processing is used to perform image processing on digital images. Feature is a remarkable part of an image. Feature detection is a image processing operation. Feature extraction is a special form of dimensionality reduction and transforming the input data into the data set of features. An image retrieval system is a system used for browsing, searching and retrieving images from a digital image database. Most traditional and common methods of image retrieval utilize the method of adding metadata such as captioning, keywords, or descriptions to the images. The image retrieval systems used in this paper is Tag Based Image Retrieval. The process of design implemented with the system architecture view comprises of the parts of the project work that encapsulates all modules ranging from module to module communication, setting initialization and system

Architecture diagrams

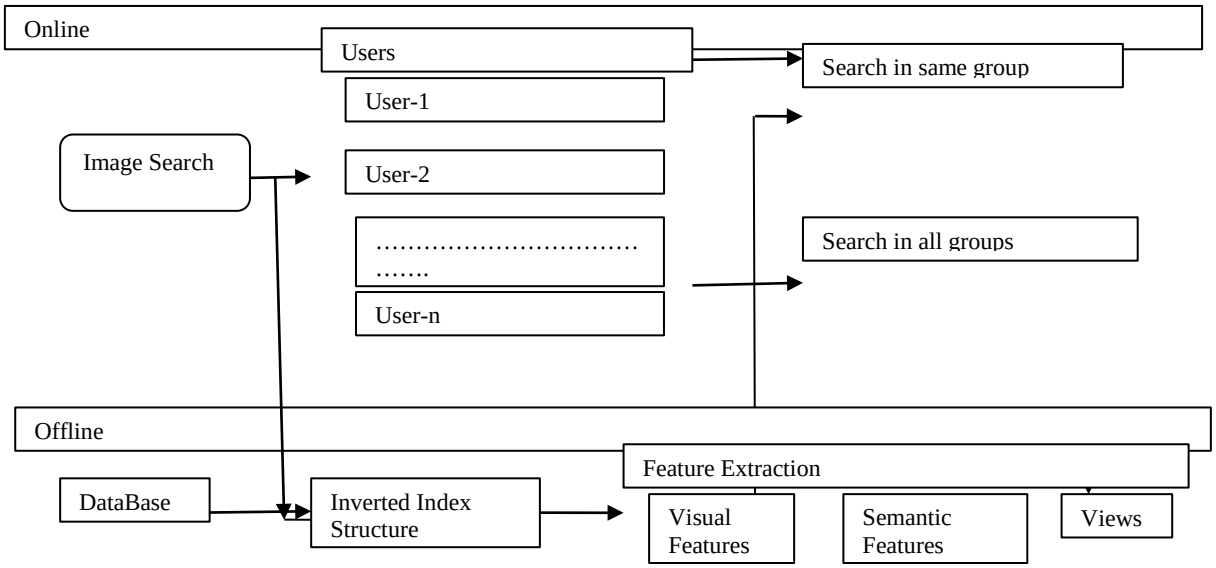

Fig.1 System framework of tag-based image retrieval with social re-ranking.

The discussed system is divided into 4 modules:

Tag-based Image Retrieval: Tag-based image search is an important method to find images contributed by social users in social websites. However, how to make the top ranked result relevant and with diversity is challenging. In this paper, a social re-ranking system for tag-based image retrieval with the consideration of image's relevance and diversity is proposed. Tag-based image search is more commonly used in social media than content based image retrieval and context-and-content based image retrieval.

Social Tags (clues):Tag mismatch. Social tagging requires all the users in the social network to label their uploaded images with their specific keywords and share with the details with others. . Every user has his own habit to tag images. Even for the same image, tags shared by different users.

Image search: The tag-based image search can be easily gathereed by using the tags as query terms. The weakly relevant tags, noisy tags and duplicated information make the search result unrelated..a tag-based image search approach with social re-ranking is proposed in this paper.

Social Re-ranking: An inverted index structure for the social image dataset was built to fasten the searching process. This is a social re-ranking method which uses the user information into the traditional tag-based image retrieval framework. The algorthims used to implement the proposed method is

1. Re-Ranking Algorithm
2. k-Means Clustering Algorithm

SCREENS

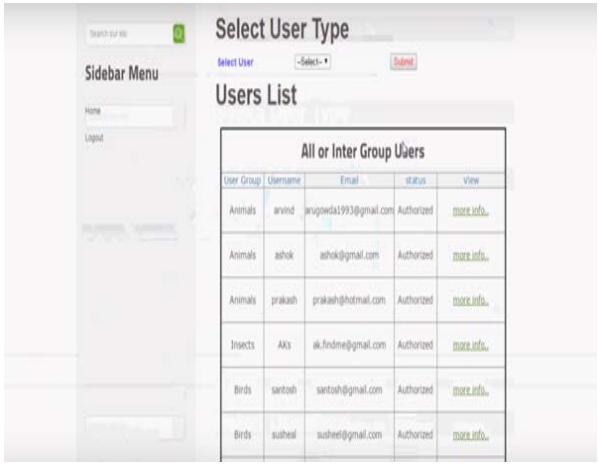

Fig.2 List of all users

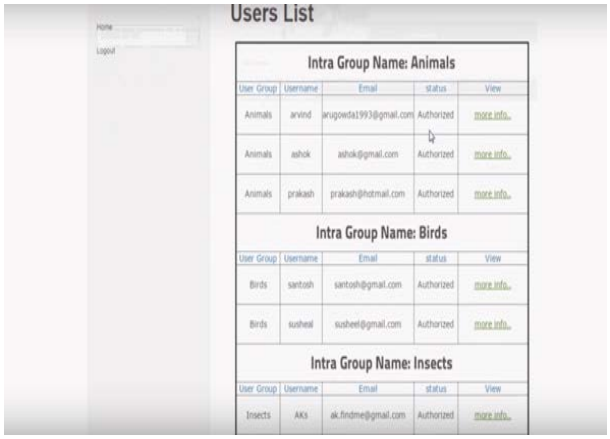

Fig.3 List of the same group

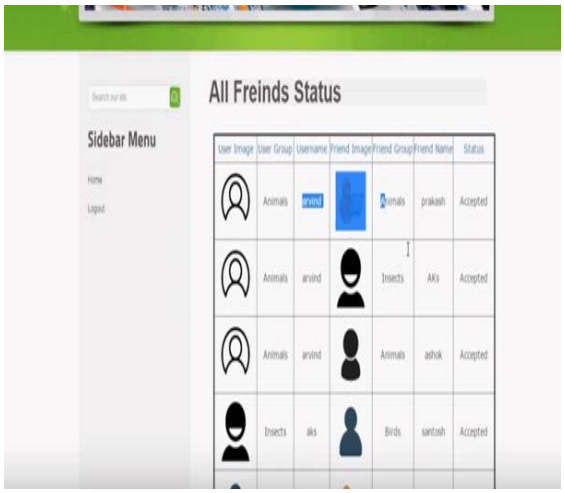

Fig.4 All friend requests and acception details

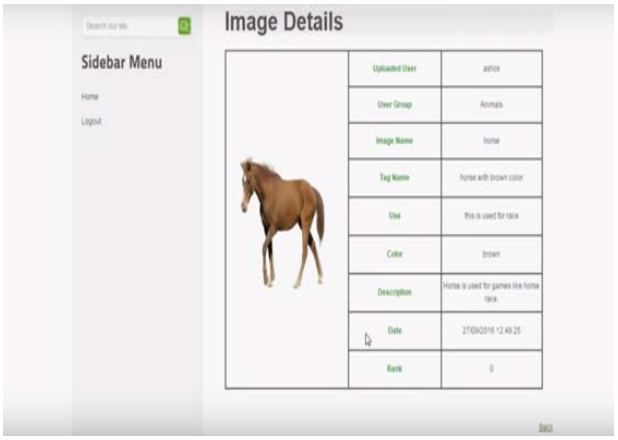

Fig.5 Image details

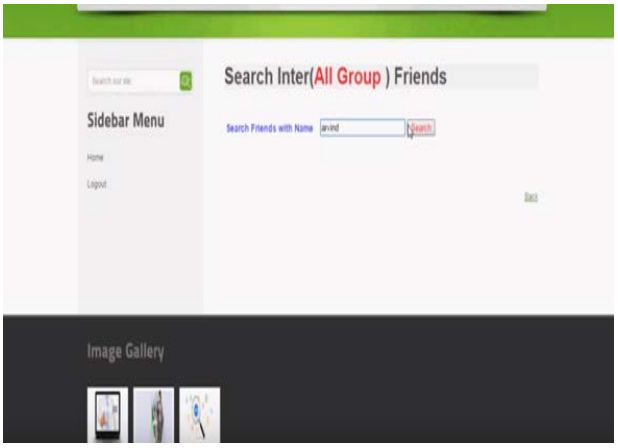

Fig.6 Search in the all group of images

V. CONCLUSION

In this paper, a social re-ranking method for tag-based image retrieval is proposed. In this social re-ranking method, all-users re-ranking and same group user re-ranking are carried out to obtain the results. In order to enhance the diversity performance, user information is firstly introduced into the proposed approach . The views of social image are also considered for a traditional regularization framework to enhance the relevance performance of retrieved results. The all-user ranking process only user's contribution is considered and the similarity among users is ignored.The future work, will be on investigate the similarity among user groups.

REFERENCES

[1] "Image Search Reranking With Hierarchical Topic Awareness," Xinmei Tian, Member, IEEE, Linjun Yang, Member, IEEE, Yijuan Lu, Member, IEEE, Qi Tian, Senior Member, IEEE, and Dacheng Tao, Fellow, IEEE pp.2177-2189, *IEEE Transactions On Cybernetics*, Vol. 45, No. 10, October 2015.

[2] "Embedding based on function approximation for large scale image search," Thanh-Toan Do and Ngai-Man Cheung pp.1-*12 IEEE*

Transactions on Pattern Analysis and Machine Intelligence Year: 2017, Vol: pp, Issue: 99.

[3] "Web Image Search Re-Ranking With Click-Based Similarity and Typicality Xiaopeng Yang, Tao Mei, Senior Member, IEEE, Yongdong Zhang, Senior Member, IEEE, Jie Liu, and Shin'ichi Satoh, Member, IEEE pp.4617-4630 ,*IEEE Transaction on ImageProcessing* , Vol.25, issue:10, year2016.

[4] "Relevance Preserving Projection and Ranking for Web Image Search Reranking", Zhong Ji, Member, IEEE, Yanwei Pang, Senior Member, IEEE, and Xuelong Li, Fellow, IEEE pp.4137-4147.

[5] "Fine-Grained Image Search", Lingxi Xie, Jingdong Wang, Bo Zhang, and Qi Tian, Senior Member, IEEE pp.636-647, *IEEE Transactions On Multimedia*, Vol. 17, No. 5, MAY 2015.

[6] "Semisupervised Hashing via Kernel Hyperplane Learning for Scalable Image Search," Meina Kan, Dong Xu, Senior Member, IEEE, Shiguang Shan, Member, IEEE, and Xilin Chen, Senior Member, *IEEE Transactions On Circuits And Systems For Video Technology*, Vol. 24, No. 4, pp.704-713, April 2014.

[7] "Towards Codebook-Free: Scalable Cascaded Hashing for Mobile Image Search", Wengang Zhou, Ming Yang, Houqiang Li, Xiaoyu Wang, Yuanqing Lin, and Qi Tian, Senior Member, *IEEE Transactions On Multimedia*, Vol. 16, NO. 3, pp.601-611, April 2014.

[8] "Contextual Hashing for Large-Scale Image Search", Zhen Liu, Houqiang Li, Wengang Zhou, Ruizhen Zhao, and Qi Tian, Senior Member, *IEEE Transactions On Image Processing*, Vol. 23, No. 4, pp.1606-1614, APRIL 2014.

[9] "Inferring User Image-Search Goals Under the Implicit Guidance of Users," Zheng Lu, Xiaokang Yang, Senior Member, IEEE, Weiyao Lin, Hongyuan Zha, and Xiaolin Chen, *IEEE Transactions On Circuits And Systems For Video Technology*, Vol.24, No.3, pp.394-406, March 2014.

[10] " iLike: Bridging the Semantic Gap in Vertical Image Search by Integrating Text and Visual Features", Yuxin Chen, Student Member, IEEE, Hariprasad Sampathkumar, Student Member, IEEE, Bo Luo, Member, IEEE Computer Society, and Xue-wen Chen, Senior Member, *IEEE Transactions On Knowledge And Data Engineering*, Vol. 25, No. 10, pp.2257-2270, October 2013.

[11] "MSIDX: Multi-Sort Indexing for Efficient Content-Based Image Search and Retrieval ",Eleftherios Tiakas, Dimitrios Rafailidis, Anastasios Dimou, and Petros Daras, Member, *IEEE Transactions On Multimedia*, Vol. 15, No. 6, pp.1415-1430, October 2013.

[12] "Learning Query-Specific Distance Functions for Large-Scale Web Image Search", Yushi Jing, Michele Covell, David Tsai, and James M. Rehg, Member, IEEE, *IEEE Transactions On Multimedia*, Vol. 15, No.8, pp.2022-2034, December 2013.

[13] " Image Search Reranking With Query-Dependent Click-Based Relevance Feedback ",Yongdong Zhang, Senior Member, IEEE, Xiaopeng Yang, and Tao Mei, Senior Member, IEEE, *IEEE Transactions On Image Processing*, Vol.23, No.10, pp.4448-4459, October 2014.

[14] "Joint Optimization Toward Effective and Efficient Image Search", Shikui Wei, Dong Xu, Xuelong Li, Fellow, IEEE, and Yao Zhao, Senior Member, IEEE, *IEEE Transactions On Cybernetics*, Vol. 43, No. 6, pp.2216-2227, December 2013.

[15] Flickr. http://www.Flickr.com/.

[16] D. Liu, X. Hua, L. Yang, M. Wang, and H. Zhang, Tag ranking. *Proceedings of the IEEE International Conference on World Wide Web*, 2009, pp. 351-360.

[17] X. Li, C. Snoek, and M. Worring, "Learning tag relevance by neighbor voting for social image retrieval," *Proceedings of the ACM International Conference on Multimedia information retrieval*, 2008, pp.180-187.

[18] D. Liu, X. Hua, M. Wang, and H. Zhang, "Boost Search Relevance For Tag-Based Social Image Retrieval.," *Proceedings of the IEEE International Conference on Multimedia and Expo*, 2009, pp.1636-1639.

[19] K. Yang, M. Wang, X. Hua, and H. Zhang, "Social Image Search with Diverse Relevance Ranking," *Proceedings of the IEEE International Conference on Magnetism and Magnetic Materials*, 2010, pp.174-184.

[20] M. Wang, K. Yang, X. Hua, and H. Zhang, "Towards relevant and diverse search of social images," *IEEE Transactions on Multimedia*, Vol. 12, No.8, pp.829-842, 2010.

[21] A. Ksibi, AB. Ammar, CB. Amar, "Adaptive diversification for tag-based social image retrieval," *International Journal of Multimedia Information Retrieval*, Vol.3, No.1, 29-39, 2014.

[22] Y. Gao, M. Wang, H. Luan, J. Shen, S. Yan, and D. Tao, "Tag-based social image search with visual-text joint hypergraph learning," *Proceedings of the ACM International Conference on Multimedia information retrieval*, 2011, pp.1517-1520.

[23] D. Cai, X. He, Z. Li, W. Ma, and J. Wen, "Hierarchical clustering of WWW image search results using visual, textual and link information," *In Proc. ACM Multimedia Conf*., 2004, pp. [24] K. Song, Y. Tian, T. Huang, and W. Gao. Diversifying the image retrieval results. *In Proc. ACM Multimedia Conf., 2006*, pp. 707–710.

[24] R. Leuken, L. Garcia, X. Olivares, and R. Zwol, "Visual diversification of image search results," *In Proc. WWW Conf*., *2009*, pp.341–350.

[25] R. Cilibrasi and P. Vitanyi, "The Google Similarity Distance," *IEEE Transactions on Knowledge and Data Engineering*, Vol.19, No.3, pp.1065-1076, 2007.

[26] X. Qian, H. Wang, G. Liu and X. Hou, "HWVP: Hierarchical Wavelet Packet Texture Descriptors and Their Applications in Scene Categorization and Semantic Concept Retrieval", *Multimedia Tools and Applications*, May 2012.

[27] X. Qian, G. Liu and D. Guo, "Object categorization using hierarchical wavelet packet texture descriptors.," *in Proc. ISM 2009*, pp.44-51.

[28] Xueming Qian, Yisi Zhao and Junwei Han, "Image Location Estimation by Salient Region Matching," *IEEE Transactions on Image Processing* Vol. 24, No.11, pp. 4348-4358, 2015.

[29] D. Wu, J. Wu and M. Lu, "A Two-Step Similarity Ranking Scheme for Image Retrieval," *In Parallel Architectures, Algorithms and Programming*, pp. 191-196, *IEEE*, 2014.

[30] D. Zhou, O. Bousquet, T. Lal and J. Weston "Learning with local and global consistency," *Advances in neural information processing systems*, Vol. 16, No.16, pp. 321-328, 2004.

[31] G. Agrawal and R. Chaudhary, "Relevancy tag ranking," *In Computer and Communication Technology*, pp. 169-173, *IEEE*, 2011.

[32] L. Chen, S. Zhu and Z. Li, "Image retrieval via improved relevance ranking,". *In Control Conference*, pp. 4620-4625, IEEE, 2014.

[33] L. Wu and R. Jin, "Tag completion for image retrieval," *Pattern Analysis and Machine Intelligence, IEEE Transactions on*, Vol. 35, No.3, pp. 716-727, 2013.

[34] Y. Yang, Y. Gao, H. Zhang and J. Shao, "Image Tagging with Social Assistance," *In Proceedings of International Conference on Multimedia Retrieval* pp.81, ACM, 2014.

[35] L. Chen, D. Xu and I. Tsang, "Tag-based image retrieval improved by augmented features and group-based refinement Multimedia", *IEEE Transactions o*n, Vol.14, No.4, pp.1057-1067, 2012.

[36] S. Lee and W. D. Neve, "Visually weighted neighbor voting for image tag relevance learning," Multimedia Tools and Applications, pp.1-24, 2013.

[37] Z. Xu, X. Luo, Y. Liu and L. Mei, "Measuring Semantic Relatedness between Flickr Images: From a Social Tag Based View," *The Scientific World Journal*, 2014.

[38] X. Li, "Tag relevance fusion for social image retrieval". Multimedia Systems, pp. 1-12, 2014. [39] X. Qian, X. Liu and C. Zheng, "Tagging photos using users' vocabularies," Neurocomputing, Vol. 111, pp.144-153, 2013. [27] D. Mishra, "Tag Relevance for Social Image Retrieval in Accordance with Neighbor Voting Algorithm," *IJCSNS*, Vol. 14 , No.7, pp. 50, 2014.

[40] Y. Hu and M. Li, "Multiple-instance ranking: Learning to rank images for image retrieval," *In Computer Vision and Pattern Recognition, CVPR 2008. IEEE Conference on* pp. 1-8.

[41] F. Sun, M. Wang and D. Wang, "Optimizing social image search with multiple criteria: Relevance," diversity, and typicality. Neurocomputing, Vol. 95, pp. 40-47, 2012.

[42] B. Wang, Z. Li and M. Li, "Large-scale duplicate detection for web image search," *In Multimedia and Expo, 2006 IEEE International Conference on* pp. 353-356.

[43] K. Weinberger and M. Slaney, "Resolving tag ambiguity". *In Proceedings of the 16th ACM international conference on Multimedia*, pp. 111-120, ACM, 2008.

[44] A. Ksibi, G. Feki and A. Ammar "Effective Diversification for Ambiguous Queries in Social Image Retrieval," *In Computer Analysis of Images and Patterns* pp. 571-578, 2013.

[45] A. Khosla and A. Sarma, " What makes an image popular?," *In Proceedings of the 23rd international conference on World wide web*, pp. 867-876, 2014.

[46] C. Haruechaiyasak, *Improving social tag-based image retrieval with CBIR technique* ,pp. 212-215, Springer Berlin Heidelberg, 2010.

[47] X. Zhu and W. Nejdl, "An adaptive teleportation random walk model for learning social tag relevance,". *In Proceedings of the 37th international ACM SIGIR conference on Research & development in information retrieval,* pp. 223-232, ACM, 2014.

[48] J. Yu, D. Tao and M. Wang, "Learning to Rank Using User Clicks and Visual Features for Image Retrieval," *IEEETrans.Cybern.* 2014.

[49] S. Ji, K. Zhou, C. Liao, Z. Zheng and GR. Xue, "Global ranking by exploiting user clicks", *In Proceedings of the 32nd international ACM SIGIR conference on Research and development in information retrieval,* pp. 35-42, ACM, 2009.

[50] G. Dupret, "A model to estimate intrinsic document relevance from the clickthrough logs of a web search engine," *In Proceedings of the third ACM international conference on Web search and data mining*, pp. 181-190. ACM, 2010.

[51] S. Cen, L. Wang, Y. Feng and H. Bai, "Efficient image reranking by leveraging click data. In Multimedia and Expo Workshops," *2014 IEEE International Conference on* ,pp. 1-4.

[52] X. Hua and M. Ye. Mining knowledge from clicks: MSR-Bing image retrieval challenge. In Multimedia and Expo Workshops (ICMEW), 2014 *IEEE International Conference on* pp. 1-4.

[53] L. Chen, D. Xu and I. Tsang, "Tag-based web photo retrieval improved by batch mode re-tagging," *In Computer Vision and Pattern Recognition, 2010 IEEE Conference on*, pp. 3440-3446. *IEEE*.

[54] A. Sun and S. Bhowmick, "Image tag clarity: In search of visual representative tags for social images," *in 1st SIGMM Workshop on Social Media, New York,* , pp. 19–26, 2009.

[55] X. Qian, X. Hua, Y. Tang, and T. Mei, "social image tagging with diverse semantics", *IEEE Trans. Cybernetics*, Vol.44, No.12, pp. 2493-2508, 2014.

[56] X. Qian, D. Lu and X. Liu, "Tag based image retrieval by user-oriented ranking,". *Proceedings of International Conference on Multimedia Retrieval*. ACM, 2015.

[57] K .Jarvelin and J.Kekalainen, "Cumulated Gain-Based Evaluation of IR Techniques," *In ACM Transactions on Information System*, 2002.

[58] Y. Gu, X. Qian and Q. Li, "Image Annotation by Latent Community Detection and Multikernel Learning,". *IEEE Transactions on Image Processing,* Vol. 24, No. 11, pp. 3450-3463 , 2015.