Survey on Tag Based Image Search

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Abstract: - Now a day's Flicker, Facebook is the popular social media websites. These sites are useful to the user to uploading their photos with free tags. There is need to develop a tag based image search engine to find out the user oriented images which are spread over the internet. The social re-ranking method is used for tag based image search. The main goal is sorting the images according to their semantic information, social views and visual information. Each user uploads many images with different tags. The initial results are based on photos or images uploaded by different users. So first sort these images using inter user re-ranking method. Users that have higher uploaded images concerning the given query rank higher. Intra user re-ranking sorts these images based on ranked user set and find out related images from each user's image set. The system gives better results using inverted index structure, visual feature, social views and semantic feature.

Keywords: Social media, Tag based Image Search, Social views, Image Search, Re-ranking, Retrieval.

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1. Introduction

There are many online social media websites like Facebook, Flicker that allows the user to upload their images with free tags. User tagging is personalized and ambiguous. The tag based image search engine returns images which are commented with specific query tag. It is used for searching images from social dataset like flicker. This image search method is flexible than context based image search and content based image search. Tag mismatch, Query ambiguity block the path for development of re-ranking technologies in tag based image search. Tag mismatch problem occurs when user tags to image with own keyword and also based on the background behind the image. This tag mismatch problem creates a number of unrelated tags. To overcome this problem tag ranking algorithm [1-3], tag-image matrix [5] approaches are used. Inverted Index structure [4, 11] is used which relates tags and these tags are related to the given image.

It is useful in keyword matching process and also increases the speed for searching the images from the social dataset. Query ambiguity occurs when a user cannot give query with a single word. But tag suggestion system always suggests words that are related to existing tag set. So it is required to add small information in the query which is related to tag suggestion system. The co-occurrences word set [9, 11] of the given query are to be considered.

Inter user re-ranking is used to sort these images from the user's given query. It eliminates the similar images from the same user in ranking result. Intra user re-ranking is applied on the result of inter user re-ranking. Feature extraction for intra user re-ranking is used to display the final relevant images.

2. Survey of Tag based Image Search Techniques

The details of the techniques on Tag processing strategy, relevance ranking approach, diversity enhancement are presented below.

Liu et al. [1] proposed tag ranking method used to rank the tags of a given image. The initial relevance score is calculated by probability density method. To refinement of the relevance score over a tag similarity graph, random walk method is proposed.

Wang et al. [2] proposed a diverse relevance ranking algorithm. It is used to maximize average diverse precision in the optimization framework. Semantic similarities of social images are mined for optimization framework. If two images are similar then their tag sets are identical. Therefore, semantic similarities of social images are based on their visual feature as well as tags.

G. Agrawal et al. [3] proposed relevance tag ranking algorithm. It is used to automatically rank the tags of an image according to their image content to overcome the problem of unrelated tags. They proposed modified probabilistic relevance method. This method included the size factor of objects with random walk based refinement.L. Chen et al. [4] developed tag based image retrieval framework. It is used to search their personal photo from the group of photos captured by the same user. The proposed system makes use of inverted file method to determine relevant and irrelevant images which related to query tags or not. They developed classification method named Support Vector Machine (SVM) with Augmented Feature (AFSVM).This method is applied to each photo to obtain its decision values. Based on decision values photos are ranked. They proposed group based tag relevance refinement method to investigate photos of each group. The Laplacian Regularized Least Squares (LapRLS) method was used to improve the retrieval performance. The Content Based Image Retrieval (CBIR) system makes use of input query as an image. But CBIR system doesn't use input query as the tag. This limitation is overcome by Tag Based Image Retrieval (TBIR) system.

L. Wu et al. [5] represented the image-tag relation by tag matrix. The performance of TBIR is based on availability and quality of tags. But sometimes tags are unreliable to describe the visual content of the image. This problem is overcome by automatically fillings the tags as well as corrects the noisy tags. It automatically completes the tag matrix with real numbers by using binary image tag matrix. This method shows the probability of assigning the tags to the related images. Optimal matrix is used to find accurate image to related query. It relates to both observed tag matrix and visual similarity between images.

L. Chen et al. [6] proposed relevance-quality ranking method. This method not only based on visual information and semantic information but also based on image quality. The problem of ambiguous or poor quality of the image is addressed by relevance-quality

ranking method. First, they rank the images according to the relevance to the query tag. Based on relevance score visual similarity of images is checked along with semantic information of related tags.

Qianet al. [7] proposed a retagging approach. It is used to cover a wide range of semantics. The final tag list of the given image is determined, based on the relevance of a tag to the image as well as its semantic information.

Xueminget al. [8] proposed image location estimation to investigate the location of an input image using image content. Firstly, they determined the location of an input image using global feature clustering. With increasing speed up select some candidate location. Secondly, they described spatial information based on visual words by using mean shift clustering to improve the image location estimation performance.

X. Qianet al. [9] proposed tag based image retrieval by user oriented ranking. Sort the images using inter and intra user re-ranking. The image database is implemented for feature extraction. To represent image dataset both visual and semantic features are used.

Qianet al. [10] proposed an approach in which landmark is summarized and diversified by each considering diverse viewpoints that are based on relative viewpoints of each image.

Qianet al. [11] proposed tag based image search by social re-ranking. It is based on inverted index structure, semantic feature, social views, and visual feature for the better result than above approaches. User oriented images are sorted with query tag by using Inter and Intra re-ranking method.
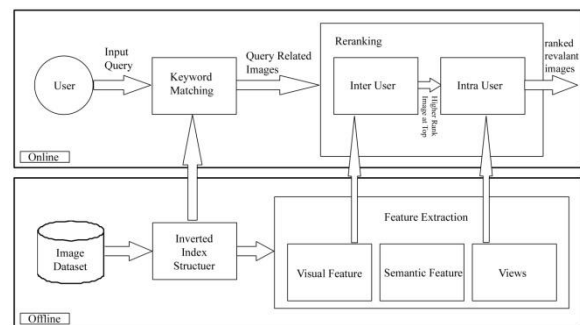
Fig.1 Tag based image search by social re-ranking [11]

The Figure 1 shows the system architecture of the tag based image search with social re-ranking. The

system consists of two sections online and offline. The offline section contains two parts: 1) Inverted Index Structure construction for image dataset. It is useful in improving image retrieval speed. 2) Feature extraction: To extract views, semantic feature and visual feature for the images dataset. The semantic feature is related to the co-occurrence word set of query tags and tags of the images. For views feature checks the click count of images.

The online section contains three parts: 1) keyword matching: To obtain corresponding images these are tagged with given query. 2) Inter User Re-ranking: Used to find out the higher contribution of the user to related query, these user's images come first. 3) Intra user re-ranking process used to retrieve the images which based on feature extraction.

3. Conclusion

In this survey, various social re-ranking methods are studied for tag based image search. Social re-ranking method, inter and intra user re-ranking is applied to obtain the final retrieved results. User's contribution is considered in inter re-ranking process, but the similarity among users is ignored.

4. References

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

[2] M. Wang, K. Yang, X. Hua, and H. Zhang. Towards relevant and diverse search of social images. IEEE Transactions on Multimedia, 12(8):829-842, 2010.

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

[4] L. Chen, D. Xu, I. Tsang. Tag-based image retrieval improved by augmented features and group-based refinement. Multimedia, IEEE Transactions on, 14(4), 1057-1067, 2012.

[5] L. Wu, R. Jin. Tag completion for image retrieval. Pattern Analysis and Machine Intelligence, IEEE Transactions on, 35(3), 716-727, 2013.

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

[7] X. Qian, D. Hua, Y. Tang, and T. Mei, "social image tagging with diverse semantics", IEEE Trans. Cybernetics, vol.44, no. 12, 2014, pp. 2493-2508.

[8] XuemingQian, Yisi Zhao, Junwei Han: Image Location Estimation by Salient Region Matching. IEEE Transactions on Image Processing 24(11): 4348-4358 (2015)

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

[10] 10. X. Qian, y. Xue, Y. Tang, X. Hou."Landmark Summarization with Diverse Viewpoints", IEEE Trans. Circuits and Systems for Video Technology, 2015

[11] 11. Xueming Qian, Dan Lu, Xiaoxiao Liu. Tag Based Image Search by Social Re-ranking. IEEE Transactions on, Multimedia 2016.

[12] Ajin P Thomas, Sruthi P.S, Jerry Rachel Jacob, Vandana V Nair, Reeba R,‖ Survey on Different Applications of Image Processing.‖ International Journal of Computer Engineering In Research Trends.,vol.4,no.2,pp. 13-19,2017.

[13] Trisha Chakraborty, Nikita Nalawade, Abhishri Manjre, Akanksha Sarawgi, Pranali P Chaudhari,‖ Review of Various Image Processing Techniques for Currency Note Authentication.‖ International Journal of Computer

Engineering In Research Trends.,vol.3,no.3,pp. 119-122,2016.

[14] Gunjan, Er. Madan Lal,‖ Investigation of Various Image Steganography Techniques in Spatial Domain.‖ International Journal of Computer Engineering In Research Trends., vol.3,no.6,pp. 347-351,2016.

[15] G.Prasanthi, A.Somasekhar,‖ Anti-Theft Tracking and Controlling Of Vehicle According Us.‖ International Journal of Computer Engineering In Research Trends., vol.2, no.12, pp. 898-903, 2015.

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