

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 12, December 2018

## Social Image Re-ranking Scheme Using Image Annotation

Sanjaykumar J Khandare, Prof. Pravin. P. Nimbalkar

M. E Student, Department of Computer Engineering, Imperial College of Engineering and Research, Pune.

Savitribai Phule Pune University, Pune, India

Department of Computer Engineering, Imperial College of Engineering and Research, Pune, Savitribai Phule Pune  
University, Pune, India

**ABSTRACT:** Image annotation has lots of research premium and multi-label learning is a powerful method for Image annotation. Step by step instructions to correlation among the hidden connection among label is an essential step for multi-label learning. Most existing multi-label learning techniques misuse the label relationship just in the output label space, leaving the relationship among label and features of images immaculate. Social media sharing websites like Flickr allow users to define images with free tags, which significantly contribute to the development of the web image retrieval and organization. Tag based image search is an important technique to find images contributed by social users in such social websites. However, how to make the top ranked result suitable and with diversity is challenging. In this work, we propose a social re-ranking system for tag-based image retrieval with the consideration of image's relevance and variance. We aim at re-ranking images according to their visual information, semantic information and social hints. Usually each user contributes several images. First we sort these images by user ranking based on view count of image. Users that have higher contribution to the given query rank higher. Then we sequentially implement user re-ranking on the ranked user's image set, and only the most related image from each user's image set is selected and duplicate images will be removed.

**KEYWORDS:** Image Annotation, Image ranking, Image Re-ranking, Social Clues, Social Media, Tag-based Image Retrieval, Image search, Feature Extraction.

### I. INTRODUCTION

#### 1.1 Background

Image annotation is a promising research topic and is still an important open problem in multimedia and computer vision fields, which has attracted much researcher's interest. The objective of image annotation is to automatically annotate an image with appropriate keywords, i.e., labels, which reflect visual content in the image. Automatic image annotation is a key step towards semantic keyword based image retrieval, which is considered to be a convenient and easy way for retrieving images on the web. It plays an important role in bridging the semantic gap between low-level features used to represent images and high-level semantic labels used to describe image content. With the increasing number of images in social network and on the sharing websites (Face book, Flicker, and YouTube, etc.), there is a huge demand for automatic image annotation.

Thus, a fundamental problem in the re-ranking of the tag-based social image retrieval is how to reliably solve these problems. As far as the tag mismatch problem is concerned, tag refinement, tag relevance ranking and image relevance ranking approach have been dedicated to overcome these problems. As for the query ambiguity problem, an effective approach is to provide diverse retrieval results that cover multiple topics underlying a query. Currently, image clustering and duplicate removal are the major approaches in settling the diversity problem. However, the essence of social images is ignored. The social images uploaded and tagged by users are user-oriented. These user-oriented images which share the same user and tagged with same query are always taken in a fixed time interval at a specific spot. It is

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 12, December 2018

well-known that, images taken in the same time interval and fixed spot are fairly similar. To diversify the top ranked search results, its better to re-rank the results by removing the duplicate images from the same user.

## 1.2 Motivation

Social image websites such as Flickr allow users to search their images with a set of descriptors such as tags. System systematically fuses the visual information, social user's information and image view times to boost the diversity performance of the search result. This proposes the user -ranking method and user re-ranking method to achieve a good trade-off between the diversity and relevance performance. These methods not only reserve the relevant images, but also effectively eliminate the similar images from the user in the ranked results.

## II. LITERATURE SURVEY

1. Xueming Qian, Xian-Sheng Hua, Yuan Yan Tang, Tao Mei, "Social Image Tagging With Diverse Semantics". IEEE TRANSACTIONS ON CYBERNETICS.

Points: This work is to improve textual-based image retrieval because the top-ranked tags are highly relevant to the image and have large semantic compensation.

2. Deepshikha Mishra, Uday Prtap Singh, Vineet Richhariya, "Tag Relevance for Social Image Retrieval in Accordance with Neighbor Voting Algorithm". IJCSNS International Journal of Computer Science and Network Security, VOL.14 No.7, July 2014.

Points: 1. the proposed algorithm does not require any model training for any visual concept; it is efficient in handling large scale image data sets. 2. The proposed algorithm predicts more relevant tags even when the visual search is unsatisfactory.

3. Meng Wang, Kuiyuan Yang, Xian-Sheng Hua, Hong-Jiang Zhang, "Towards a Relevant and Diverse Search of Social Images". IEEE TRANSACTIONS ON MULTIMEDIA, VOL. 12, NO. 8, DECEMBER 2010.

Points: 1. this works shown that the diversity of search results can be enhanced while maintaining a comparable level of relevance. 2. Effectiveness.

4. Xueming Qian, Dan Lu, Xiaoxiao Liu, "Tag Based Image Search by Social Re-ranking", IEEE transactions on multimedia, MM-006206

Points: 1. Proposed method is effective and time-saving. 2. This social re-ranking method is effective and efficient.

5. Jiaming Zhang, Shuhui Wang, Qingming Huang, "Location-Based Parallel Tag Completion for Geo-tagged Social Image Retrieval".

Points: 1. the learned tag sub-matrix of each POI reflects the major trend of users' tagging results with respect to different POIs and users.

2. This parallel learning process provides strong support for processing large scale online image database.

3. Achieves better accuracy for automatic image annotation.

4. Enhances the computational efficiency.

6. Shuhui Jiang, Xueming Qian, Jialie Shen, "Author Topic Model-Based Collaborative Filtering for Personalized POI Recommendations". IEEE TRANSACTIONS ON MULTIMEDIA, VOL. 17, NO. 6, JUNE 2015

Points: In this work, user preference topics, such as cultural, cityscape, or landmark, are extracted from the geo-tag constrained textual description of photos via the author topic model instead of only from the geo-tags (GPS locations).

7. Xiyu Yang, Xueming Qian, Yao Xue, "Scalable Mobile Image Retrieval by Exploring Contextual Saliency". IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 24, NO. 6, JUNE 2015

Points: This approach requires less bandwidth and has better retrieval performance.

8. Jun Yu, Dacheng Tao, Meng Wang, Member, Yong Rui, Fellow, "Learning to Rank Using User Clicks and Visual Features for Image Retrieval". IEEE TRANSACTIONS ON CYBERNETICS, VOL. 45, NO. 4, APRIL 2015.

Points: 1. above proposed model is more robust and accurate ranking model. 2. In this model, the noises in click features will be removed by the visual content.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 12, December 2018

## III. PROPOSED APPROACH

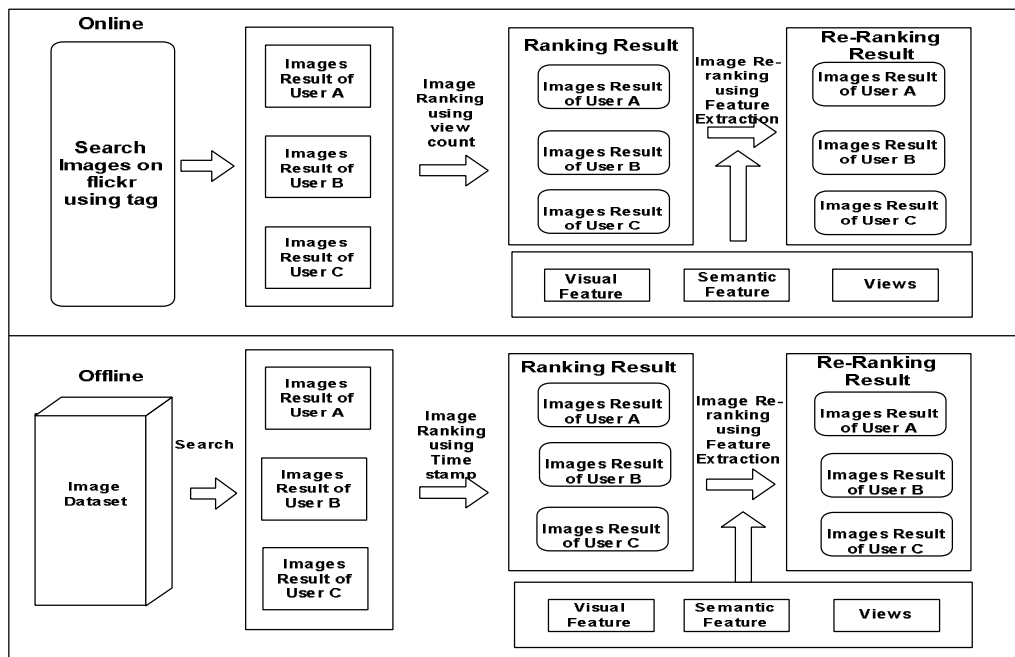


Fig.01 System Architecture

### System overview-

Proposed system will provide image search top result data. We propose a social re-ranking algorithm which user information is firstly introduced into the traditional ranking method considering the semantics, social clues and visual information of images. This paper proposes a new image search system that also extends the user profile with user's offline dataset and user's contribution.

In proposed social re-ranking algorithm, firstly rank the images by view count and then to re-ranking that the url of images in specific folder and achieve the feature extraction goal and removing duplication by one by one feature matching.

We propose a social re-ranking algorithm which user information is firstly introduced into the traditional ranking method considering the semantics, social clues and visual information of images. In offline part, the searching of image using name and also tags.

### Advantages-

1. Implement a searching based system.
2. Reduce the sending large no. of http request to server.
3. Getting user expected result.
4. Remove image duplication

## IV. ALGORITHM

Color feature is one of the most widely used visual features in image retrieval, for its invariance with respect to image scaling, rotation, translation. In this work, an image is divided into four equal sized blocks and a centralized image with

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 12, December 2018

equal-size. For each block, a 9-D color moment is computed, thus the dimension of color comment for each image is 45. The 9-D color moment of an image segment is utilized, which contains values of mean, standard deviation and skew-ness of each channel in HSV color space.

Edge Detection: Most of the shape information of an image is enclosed in edges. So first we detect these edges in an image and by using these filters and then by enhancing those areas of image which contains edges, sharpness of the image will increase and image will become clearer.

Canny Edge Detection:

Canny edge detection is a technique to extract useful structural information from different vision objects and dramatically reduce the amount of data to be processed. It has been widely applied in various computer vision systems. Canny has found that the requirements for the application of edge detection on diverse vision systems are relatively similar. Thus, an edge detection solution to address these requirements can be implemented in a wide range of situations. The general criteria for edge detection include:

1. Detection of edge with low error rate, which means that the detection should accurately catch as many edges shown in the image as possible
2. The edge point detected from the operator should accurately localize on the center of the edge.
3. A given edge in the image should only be marked once, and where possible, image noise should not create false edges.

The Process of Canny edge detection algorithm can be broken down to 5 different steps:

1. Apply filter to smooth the image in order to remove the noise
2. Find the intensity gradients of the image
3. Apply non-maximum suppression to get rid of spurious response to edge detection
4. Apply double threshold to determine potential edges
5. Track edge by hysteresis: Finalize the detection of edges by suppressing all the other edges that are weak and not connected to strong edges.

Texture feature describes the structure arrangement of surfaces and their relationship to the environment, such as fruit skin, clouds, trees, and fabric. The texture feature in our method is described by hierarchical wavelet packet descriptor (HWVP). A 170- D HWVP descriptor is utilized by setting the decomposition level to be 3 and the wavelet packet basis to be DB2.

## V. MATHEMATICAL MODEL

Equations and Notation:-

1. Let  $view_i$  represents the  $view_i$  times of the image  $i$ , its normalized form can be described as follows.

$$V_{t_i} = \frac{view_i - view_{min}}{view_{max} - view_{min}}$$

Where,  $view_{max}$  and  $view_{min}$  are the maximum and minimum views of the images which share the same user with image  $i$  in our Flickr dataset.

2. Co-occurrence is a linguistics term that can either mean concurrence/coincidence. In a more specific sense, co-occurrence means two terms which often appeared in the text corpus in a certain order.

$$M_i = \exp\left\{-\frac{\max(\log R(q), \log R(s_i)) - \log R(q, s_i)}{\log(N) - \min(\log R(q), \log R(s_i))}\right\}$$

Where,  $N$  is the number of images in our image dataset,  $R(s_i)$  is the number of images which tagged with  $q$  and in our image dataset and  $M_i$  is the weight.

3.  $C_i = \frac{1}{\sum_{m=1}^l \text{sign}(s_m)} \sum_{m=1}^l \text{sign}(s_m) * M_m$

Where,  $\text{sign}(s_m)$  denotes whether the image  $i$  contains tag  $s_m$  or not i.e.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 12, December 2018

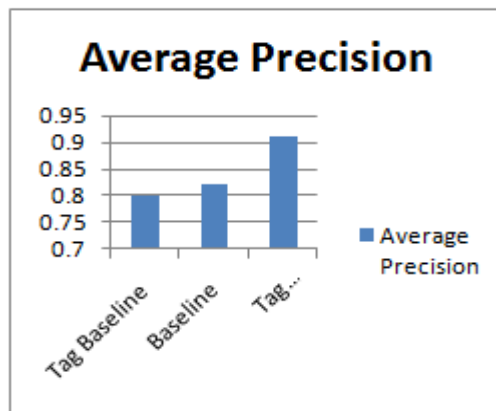
$$\text{sign}(s_m) = \begin{cases} 1; & \text{if image } i \text{ is tagged with } s_m \\ 0; & \text{otherwise} \end{cases}$$

$C_i$  is the tag set of image  $i$ .

## VI. RESULT ANALYSIS

Average precision (AP): AP measures the ranking quality of the whole list. Since it is an approximation of the area under the precision-recall curve, AP is commonly considered as a good combination of precision and recall. The AP value is calculated as  $(1/R) \sum_{i=1}^R \left(\frac{R_i}{i}\right) \delta_i$  where  $R$  is the number of relevant images in the list,  $R_i$  the number of relevant images in the top  $i$  ranked images,  $\delta_i=1$  if the  $i^{\text{th}}$  image is relevant and 0 otherwise. For evaluation of the overall performance, we use mean average precision abbreviated as MAP, a common measurement in information retrieval. MAP is the mean value of the AP over all queries in the image retrieval experiment and all test images in the tag suggestion experiments.

Results demonstrate that the proposed scheme is able to boost the diversity and relevance performance simultaneously also our social re-ranking method is effective and efficient.



	Average Precision
<b>Tag Baseline</b>	<b>0.8</b>
<b>Baseline</b>	<b>0.82</b>
<b>Tag Relevance(Images)</b>	<b>0.91</b>

## VII. CONCLUSION

In this work, we propose a social re-ranking approach for tag-based (image annotations) image retrieval. In this social re-ranking technique, ranking and re-ranking are carried out to obtain the retrieved results. Firstly rank the images by view count using flickr API on online and by timestamp on offline dataset. Also, re-rank using image feature extractions to remove the duplicate images to achieve uniqueness. In addition to this, much information in Flickr dataset are still ignored, such as title information, time stamp, so will work on this for ranking.

# International Journal of Innovative Research in Science, Engineering and Technology

*(A High Impact Factor, Monthly, Peer Reviewed Journal)*

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 12, December 2018

## REFERENCES

- [1] Xueming Qian, Xian-Sheng Hua, Yuan Yan Tang, Tao Mei, "Social Image Tagging With Diverse Semantics". IEEE TRANSACTIONS ON CYBERNETICS.
- [2] Deepshikha Mishra, Uday Prtap Singh, Vineet Richhariya, "Tag Relevance for Social Image Retrieval in Accordance with Neighbor Voting Algorithm". IJCSNS International Journal of Computer Science and Network Security, VOL.14 No.7, July 2014.
- [3] Meng Wang, Kuiyuan Yang, Xian-Sheng Hua, Hong-Jiang Zhang, "Towards a Relevant and Diverse Search of Social Images". IEEE TRANSACTIONS ON MULTIMEDIA, VOL. 12, NO. 8, DECEMBER 2010.
- [4] Xueming Qian, Dan Lu, and Xiaoxiao Liu, "Tag Based Image Search by Social Re-ranking".IEEE transactions on multimedia, MM-006206.
- [5] Jiaming Zhang, Shuhui Wang, Qingming Huang, "Location-Based Parallel Tag Completion for Geo-tagged Social Image Retrieval".
- [6] Shuhui Jiang, Xueming Qian, Jialie Shen, "Author Topic Model-Based Collaborative Filtering for Personalized POI Recommendations". IEEE TRANSACTIONS ON MULTIMEDIA, VOL. 17, NO. 6, JUNE 2015.
- [7] Xiyu Yang, Xueming Qian, Yao Xue "Scalable Mobile Image Retrieval by Exploring Contextual Saliency". IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 24, NO. 6, JUNE 2015
- [8] Jun Yu, Dacheng Tao, Meng Wang, Member, Yong Rui, Fellow, "Learning to Rank Using User Clicks and Visual Features for Image Retrieval". IEEE TRANSACTIONS ON CYBERNETICS, VOL. 45, NO. 4, APRIL 2015.