

# **REVIEW OF RE-RANKING TECHNIQUES FOR WEB BASED IMAGE SEARCH**

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## **ABSTRACT**

*To retrieve image form a web, text-based image search is easy and known process in which we give image names or tags as query to search engine so that it will provide desired set of images relevant to a query from huge image collection. Web based image re-ranking is used to produce a desired way to improve the result of web based image search. Feature extraction and ranking function design are two key steps in image search re-ranking. The purpose of web based image search re-ranking is to reorder retrieved elements to get optimal rank list. However, existing re-ranking algorithms are limited for two main reasons: 1) the textual meta-data associated with images is often mismatched with their actual visual content and 2) the extracted visual features do not accurately describe the semantic similarities between images. A major challenge in re-ranking the web based image is that the similarity of visual features does not well correlate with image. This paper presents a detail review of comparative analysis of different Image Re-ranking approaches. The purpose of the survey is to provide an overview and analysis of the functionality and future scope of existing image re-ranking systems, which can be useful for researchers for developing effective system with more accuracy.*

***Keywords: Feature Extraction, Image Re-Ranking, Image Retrieval, Image Search, Ranking Function***

## **I INTRODUCTION**

Image Search Re-ranking is defined as the refinement of search results by employing image visual information to reorder the initial text-based search results. It comes from the observation that the noisy text-based search results still contain satisfactory images in top hundreds of search results. The ranking of images based on a text-based search is considered a reasonable baseline. Extracted visual information is then used to re-rank related images to the top of the list. Therefore, reordering of these top ones with visual cues is possible to satisfy user's search experience in both accuracy and response time. It can be viewed as a post-process of core search.

Thousands of images are uploaded to the internet with the explosive growth of online social media and the popularity of capture devices [1], thus building a satisfying image retrieval system is the key to improve user search experience. Due to the success of information retrieval, most commercial search engines employ text-based search techniques for image search by using associated textual information, such as file name, surrounding text, URL, etc. Even though text-based search techniques have achieved great success in document

retrieval, text information is often noisy and even unavailable. In order to improve search performance, image search re-ranking, which adjusts the initial ranking orders by mining visual content or leveraging some auxiliary knowledge, is proposed, and has been the focus of attention in both academia and industry in recent years. Most of the existing re-ranking methods utilize the visual information in an unsupervised and passive manner to overcome the “semantic gap” (the gap between the low-level features and high-level semantics). Although multiple visual modalities have been used to further mine useful visual information, they can only achieve limited performance improvements. This is because these re-ranking approaches neglect the “intent gap” (the gap between the representation of users’ query/demand and the real intent of the users).

Current ISR approaches mainly focus on two important aspects: feature extraction and ranking function. Visual features always play a fundamental role in ISR and other image search applications where lots of approaches have been employed and developed for example local and multimodality fusion features in ISR, respectively. Query-dependent re-ranking features for a query-dependent re-ranking model, which are based on the exploitation of the visual context, initial ranking, etc. To effectively fuse multiple modalities, a graph-based re-ranking algorithm is proposed that can effectively integrate the learning of relevance scores, weights of modalities, and distance metric into a unified scheme.

## II SURVEY ON METHODOLOGY

Different Researchers are working on the methods used to get desired performance of web search engine.

Xiaopeng Yang, Tao Mei, [1] proposed click-based multi-feature similarity learning algorithm. Based on the learnt click-based image similarity measure, they conducted spectral clustering to get the final re-rank list by calculating click-based clusters typicality and within clusters click-based image typicality in descending order.

Zhongji, Yanwei Pang, Xuelong Li, [2] addressed the feature extraction and ranking function problems in image search re-ranking based on the hypersphere idea in one-class classification, they observed two things : 1. How to transfer the ISR methods to solve the outlier removal problem is an interesting research direction. 2. Deep learning has shown its promising successes in image classification and CBIR, however it has little significant influence on TBIR. How to employ it in TBIR and ISR is also a challenging direction

Yongdong Zhang, Xiaopeng Yang, and Tao Mei [3] presented Image Search Re-ranking With Query-dependent Click-Based Relevance Feedback algorithm emphasizes the successful use of click-through data for identifying user search intention, while leveraging multiple kernel learning algorithm to adaptively learn the query-dependent fusion weights for multiple modalities. This paper has considered only image search relevance, though image diversity is another important factor in search performance. Future work will be enhancing the diversity of re-ranked images by duplication detection or other such methods.

JunjieCai, Zheng-Jun Zha, Meng Wang, Shiliang Zhang, and Qi Tian [4] proposed a visual-attribute joint hypergraph learning approach to simultaneously explore two information sources. A hypergraph is constructed to model the relationship of all images.

un Yu, Member, Yong Rui and Dacheng Tao [5] proposed multimodal hypergraph learning-based sparse coding method for image click prediction, and apply the obtained click data to the re-ranking of images. The proposed method is effective in determining click prediction.

Dan Lu, Xiaoxiao Liu, and XuemingQian [6] proposed a social re-ranking system for tag-based image retrieval with the consideration of an image's relevance and diversity to re-ranking images according to their visual information, semantic information, and social clues.

Daniel Carlos and his team [7] presented approach for combining different re-ranking and rank aggregation methods, considering four novel combination schemes. The main idea of this work is exploiting complementary rankings computed by different methods in order to obtain more effective results.

SongheFeng, ZheyunFeng, and Rong Jin [8] proposed a novel tag ranking scheme for automatic image annotation. This scheme casts the tag ranking problem into a matrix recovery problem and introduces trace norm regularization to control the model complexity. In future they plan to apply the proposed framework to the image annotation problem when image tags are acquired by crowd sourcing that tend to be noisy and incomplete.

XuemingQian, Xianglong Tan, Yuting Zhang, Richang Hong and Meng Wang [9] proposed sketch-based image retrieval method that uses initial result grouping, re-ranking via visual verification, and a relevance feedback system to search for more similar images. The proposed method can't find the images with differently size and rotation. So to solve this problem in future this method can be combined with a wide range of existing SBIR methods to improve the final retrieval results.

Rodriguez-Vaamonde, Lorenzo Torresani [10] addressed a method that finds whether the content of the pictures appearing in a Web page can be used to enrich the semantic description of an HTML document and consequently boost the performance of a keyword-based search engine.

LingxiXie, Qi Tian, Senior Member, IEEE, Wengang Zhou, and Bo Zhang [11] proposed an efficient re-ranking approach consisting of two successive modules, i.e., incremental query expansion and image-feature voting, to improve the recall and precision.

Xiaogang Wang, Shi Qiu, Ke Liu, and Xiaoou Tang [12] proposed framework that automatically offline learns different semantic spaces for different query keywords to significantly improve the effectiveness and efficiency of online image re-ranking. Future work will be to find the keyword expansions used to define reference classes can incorporate other metadata and log data besides the textual and visual features. In order to update the reference classes over time in an efficient way, how to adopt incremental learning under this framework needs to be further investigated. Although the semantic signatures are already small, it is possible to make them more compact and to further enhance their matching efficiency using other technologies such as hashing

Guosheng Kang, Jianxun Liu, Mingdong Tang, Buqing Cao[13] presented a hybrid Web service ranking approach based on user behaviour and QoS. They incorporate user behavior, functional relevance and QoS utility of Web services simultaneously for Web service ranking.

Zhen Liu, Houqiang Li, Wengang Zhou, Ruizhen Zhao, and Qi Tian [14] Proposed an algorithm to represent feature's spatial context information with a binary code. In addition, it discovers that the multimode property is useful to improve the retrieval performance. Future work will be to investigate how to reduce the number of features in a single image while the retrieval performance is preserved.

### III CONCLUSION

In this paper we have given different techniques to search images from web. To refine the quality of retrieved images, various postprocessing methods have been adopted after the initial search process. Various experimental results on image re-ranking suggest that above method can improve the results returned by commercial search engines. We only take image search relevance into consideration, though image diversity is another important factor in search performance. In future work, Diversity of re-ranked images can be enhanced by duplication detection or other such methods.

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