

A Study on Web Based Image Search by Re-Ranking Techniques

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Abstract— the continuing growth of online digital photos, video data and image retrieval an active research area. The ever-growing importance of rich visual information in today's web is evidenced by the popularity of social web image retrieval. I focus primarily on the process of searching and retrieving images using a visual query known as content-based image retrieval our primary aiming is reducing the semantic gap between the low-level visual features and high-level image features. This paper proposed for comprehensive survey In this paper is to focus on the survey of various existing methods and technologies and application along with has been discussed some new clustering techniques, distance metrics methods, also of these various re-ranking methods also addressed. Finally, we have been details discussed ten journals paper.

Keywords— Re-Ranking, Distance Metrics (DM), TBIR.

I. INTRODUCTION

Image re-ranking, as an efficient manner to improve the results of web-based image search, has been adopted by current commercial search engines. Given a query keyword, a pool of images is first retrieved by the search engine based on textual information. By asking the user to select a query image from the pool, the remaining images are re-ranked based on their visual similarities with the query image. A major challenge is that the similarities of visual features do not well correlate with images' semantic meanings which interpret users' search intention. On the other hand, learning a universal visual semantic space to characterize highly various images from the web is difficult and inefficient. The text based approach is ancient and traditional retrieval techniques system. Generally, mostly retrieval system has been used in keywords [4]. Early the text Based Approaches has been most used in image search engines retrieval methods. it does not using content features (CBIR) but Text based Approaches on the textual annotation of images. Normally text retrieval using document retrieval. The (TBIR) has been exclusively used in image search engines e.g. Yahoo, Google, and Bing. Many text retrieval search gathering and widely commercial applications developed [2]. Text search approaches are following almost searching in images and documents and videos. e.g, Bing, Google, and Yahoo. TBIR Methods do not follow the semantic content of

images. For example, keyword-based image search method is commonly text based results are re-ranked [5]. Which the system returns the ranked relevant images whose surrounding texts contains that contains the query keywords, has also been the ranking score is obtained according to some similarity metrics. Distance metrics [3], [12], [13] between the query keyword and the textual features of similarity images. Other one CBIR methods image is to re-rank or filtrate the images corresponding to some weights categories images [3], [4]. The Number of existing CBIR search engines have been developed more re-ranking methods [5],[7].

Generally The numerous approaches have been proposed for CBTR image search re-ranking, The most text based popular model for object retrieval can be only more achieved. One of the important text-based method is BoW (Bag-Of-Words) method is based on validating the spatial arrangement [17], [18]. Generally, object retrieval system using from semantic features. Text-based image retrieval techniques are based on the textual descriptions about the pictures [17], [19], [22].

A. Content-Based Approaches.

CBIR Approaches system widely used in multimedia search engines. The most search engine works on Text based Approaches which traditional search method that is using

manual annotation of images. Initially text-based search engine is not a much more efficient system. In (CBIR) Content or image based image retrieval overcome the text-based image retrieval or concept based image indexing, Content-based retrieval system using various of the department such as medical field, engineering field, army field also various commercial operation methods [1],[7].

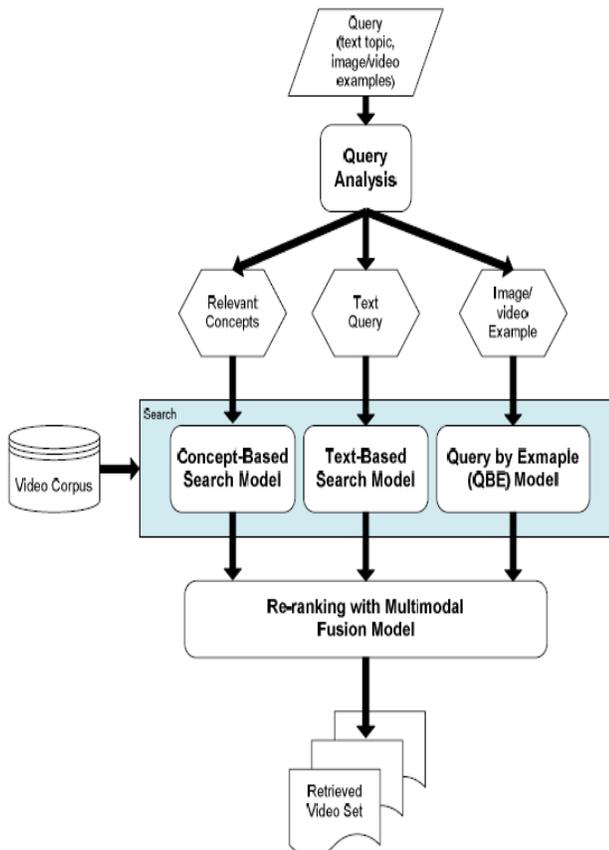


Figure 1. Re-Ranking framework overview

Hybrid approaches are computing the visual content of images and the textual information obtained from Web image retrieval. Hybrid methods is calculate the wavelet transform the extracting color features and Gabor transform for extracting the texture features of images represented in horizontal vertical and diagonal direction methods. Such a kind of methods exploits the usage of the image visual information for refining the initial text-based queries [25], [29]. The re-ranking for image search results can achieve significant performance improvements.

The remaining paper is consist of five sections as follows. In section II we summarize briefly related work on Web Image Re-ranking methods. Section III recent multimedia search models. Section IV we review some measurement techniques. Section V, these section comprises different

methodologies about re-ranking models. In section VI we draw our conclusion.

II. RE-RANKING MODELS

Re-ranking methods are given higher priority to the in the densest component, and we give higher rank order another based on its similarities to the image in the densest components [1],[2],[3],[5]. We have to approach find the largest density image components. Re-ranking to maximize relevant of the image results, and to achieve diversity of image results which using we can getting very efficient and most similarity measurements of the results. As most re-ranking methods for semantic search are highly motivated by the computed re-ranking and rank aggregations methods in the image processing domain [17], [19],[23].

Content-based image retrieval most efficient image retrieval system techniques, re-ranking methods consisting semantics gap and visual information which Bag-of-Words (BoW) that is checking the spatial feature extraction. The main motivation of removed noisy re-ranking which orders visual content based retrieved [17].

A. Post – retrieval clustering

We have use post-retrieval clustering methods can be retrieved on the top-ranked most similarity images. Post-retrieval clustering makes similarity groups top most of the images were retrieved, that contains similar images which similarity or relevant image are according to the cluster analysis [22]. Post retrieved cluster two types are following. Firstly steps we calculate the similarity between the query image and database images, Secondly Steps we construct HACM .HACM is following the steps 1.Single link 2.complete link 3.Group average link [22], [29].

B. Textual Re-Ranking.

Textual Re-Ranking (CRR) aiming the construct most relevant images retrieved, this Technique uses grayscale image representatives of distance metrics computed by CBIR. Each image reprehensive in pixel values. Re-Ranking algorithm process by constructing an image for each one of its K-nearest neighbors. Each image content is summarized using image feature extraction techniques [15]. Median filters techniques also are used to process the context images, its main process is filtering avoid wrong similarity images. Regularly a binary is obtained from the grayscale level images, where the black pixels represent similarity between the images [17].

C. RL-sim Re-Ranking Algorithm.

The main motivation of RL-Sim Re-Ranking is constructed the most similarity images retrieved. Visual information encoded in the similarity measured between top-ranked orders which provide resources for improving the effectiveness of CBIR system [6], [19].

D. Bayesian Re-Ranking.

Bayesian Re-Ranking methods are combining visual and textual information from the probabilistic viewpoints, and it makes visual re-ranking a very efficient system in the Bayesian re-ranking methods [19]. Contextual re-ranking is a mixed process of both texture and visual features to obtain effective CBIR image retrieval search system. This means of re-ordering the images based on two features which textual feature and visual information. It is called image search re-ranking [2], [6]. The textual information is replicated as the prospect. It returns the correlation between the re-ranked list out and the initial one. The semantic features are reproduced as a limited prior which indicates the re-ranking score consistency within semantic similarity samples [23]. The main aim of the Bayesian method is re-ranking is formulated as effective the product of the limited prior and the nearest features values. Bayesian visual re-ranking methods are obtained best re-ranking results by efficiency visual consistency then avoid the classification distance. It is proposed a novel similarity-wise methods which measure the re-ranking distance based on the disagreement in regarding of similarity or visual features-wise orders [1,], [15], [17], [18].

E. Circular Re-Ranking Algorithm.

The motivation of circular re-ranking is constructed most similar web image retrieval. They have two general approaches one is a contextual pattern and multi-modality fusion [1], [17]. This method is reinforce the mutual exchange of information across different modalities for improving search performance methods [17], [28].

Circular re ranking is constantly making the idea of mutual reinforcement between three patterns. They are three features which text, color moments and Bag-of-words (BoW). The text methods represent each image as a vector keywords extracted from its surrounding text. BoW is generated a visual vocabulary of words to describe an image. Color moments divides each image into 5-by-5 partitions and extract from 225 dimensions [21], [29].

F. Re-ranking by Semantic Signatures.

Semantic Signatures are representative visual features that are summaries the low and high-level functions [2], [4], [6]. Several semantic signatures computed from separate semantic features has greater precision than calculating a

C. Crowd-Re-Ranking.

Crowd re-ranking methods are multiple search techniques. It analysis the crowdsourcing knowledge available on the internet. It is provide to the best single list from various search system methods. e.g. Multiple video and image search engines and sites [29].

single semantic signature from combined several features. The visual features or semantic features of images are projected into their related visual semantic spaces automatically learned through keyword expansions at the offline stage.

Visual semantic signatures are combined four steps. 1. Predefined adaptive weight categories. 2. Image clustering based on the visual content. 3. PRF (Pseudo-relevant feedback approach) it used top-ranked positive images. 4. NPRF-Negative Pseudo-relevance feedback methods proposed. Above four methods computing two ways. (1). QSVSS Single (2). QSVSS Multiple. Query. It is both Specific Visual semantic space single signatures, a Single semantic signatures computed from one SVM classifier trained by combining all types of visual features [3], [4], [5], [6] QSVSS Multiple Query Specific Visual semantic space using multiple signatures, from multiple SVM classifier [3], [26].

III. MULTIMEDIA SEARCH MODELS.

Visual search methods consist of several components e.g. text, visual, concept search. Text search re-ranking techniques they are following 1. Self-Re-Ranking 2. Example based re-ranking 3. Crowd-re-ranking and 4. Interactive re-ranking [22], [27].

A. Self-Re-Ranking.

Self-re-ranking mainly focuses on finding repeated patterns in the initial search results without any outer knowledge. Then uses the familiar patterns to perform re-ranking. Which only used the initial or self-re-ranking. It is primary goal to discover consistent visual patterns from the original ranked lists. They also following 1. Clustering Based Methods. 2. Pseudo relevant feedback 3. Object recognition-based methods. 4. Graph-based methods [17], [20].

B. Example-Based Re-Ranking.

Example-based re-ranking is also called text query re-ranking techniques. Its motivation is to parse a query into a structured statement expressed in database manipulation languages. It is mainly explained on query example provides by user e.g., text reveal image name or video capture. Example based-Re-ranking are following methods. 1. Concept-based method 2. Linear multimodal fusion. 3. Query expansion 4. Geometric verification [29].

D. Post Retrieval Clustering.

We have used post-retrieval clustering methods can be retrieval on the top-ranked most similarity images. Post-retrieval clustering makes similarity groups top most of the images were retrieved, that contains similarity images

.which similarity or suitable image is according to the cluster analysis.

Post retrieved cluster two types are following. Firstly steps we calculate the similarity between the query image and database images, Secondly steps we construct HACM.HACM is following the steps 1.Single link 2.complete link 3.Group average link.

E. Interactive Re-Ranking.

It is also called the user interactive re-ranking. Interactive re-ranking involves user communicated in the loop. The user also able to edit to change a part of the search results re-ranking methods. [22], [23], [29].

Re-Ranking methodologies for improving image search performances [1],[2],[3],[4],[6].In this methods an effective way to improving the results image based on images searching system, Initially web image search engines using keywords also explain the query keywords [2], They knew that they suffer from the query keywords [9],they could not

find accuracy images which are semantic gap and intention gap which is the Our Aiming at improving retrieved images from image search engines [19],[22], we have proposed a novel image ranking method that combines visual features and text features .this feature vector will be used finding similarity image from huge database images. To solve Re-Ranking Methods are followings (i).Aesthetic –Based Approach[28].which is proposed Re-ranking images retrieved from search engines that are combined metrics[19].(iii).post – retrieval clustering that is using The top-ranked images [23] .They have two step method to retrieved images which is one calculate similarities Problem between the query keywords. Main problem overcoming the using CBIR [26].which is one the biggest challenges of content based image retrieval is to semantic signature [22]. Such as easily image Re ranking approach have been web scale image search engines such as Google, Yahoo. For example, give one query keywords for “apple” as results are retrieved relevant and irrelevant images.



Figure 2. Sample query Image

Conducted intensive experiments indicated the importance of both visual and content information [26] for the example query keyword as Apple as well as retrieved Image Retrieval.

Conventional and novel images features [21],[23],[28].(ii).Bayesian Visual re-ranking which is combining query visual and textual similarity.

Images and second is HACM (Hierarchical agglomerative clustering methods) they retrieved images from the huge database [25].

F. Tools for Re-ranking.

VISTO (Vector Image Search Tools) [35] that is open source tools which are using SVG (Scalable Vector Graphics) format. Advanced searching tools another one

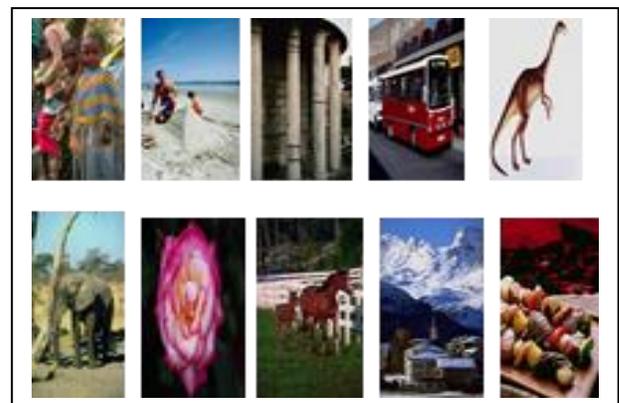


Figure 3. Sample database images.

Clustering task is grouping set of objectives which is same group and most similar objective groups. They have many clustering techniques K-means clustering [5], [16],

Algorithm are initialized one single cluster which contains all the data set objects [6].

Most clustering falls into two classes they are following Hierarchical and Non-hierarchical which is first used because of their low computational requirements this kind of methods commonly need an original number of clusters techniques. Hierarchical clustering methods have much attention which uses the maximum amount of flexibility.

To avoid misclassification in SVM (Support Vector Machine) is reduce the image search space [10], [26] the Main objective is efficient image classification, they are one cluster and continues by joining them.

Are using SVM-PWC (Support Vector Machine –Pairwise Coupling Technique) which is statistical analysis methods.

The clustering techniques differ from several methods [17], K-Means can be done on SIFT [13], SIFT (Scale Invariant Feature Transform) is widely using the feature extraction method which is extraction from huge database images [5]. The Mutual KNN (k-nearest neighbor graph) Graph is defining neighborhood for each data paint which is using improving performance dataset [8].

G. Hard versus and fuzzy c-means.

Hard c-means (HCM) is most widely used in clustering methodologies for grouping data [11], [12]. Two types of clustering techniques are used 1.Text based clustering and 2.Content-Based Clustering. Most of the clustering used in Content based image clustering .The semantic consistent, which makes continuously within the clusters with a higher relative will be re-ranked higher Image clustering techniques to identifying visual information similar groups to a user query image and create an effective user interface for

searching image features. [11].Fuzzy c-means clustering methods

Are generation of higher relevance clustering which belongs to more than one cluster We have recently proposed a Fast and exactly feature HCM (Hard c-means) variant it also called Weighted Sort means (WSM) which optimized reduced data with accelerated nearest values or data are searched [26].

The goal of clustering is to divide features into groups these groups can represent a semantic meaning and gives the information that they have similarity properties. Machine learning is two categories.1.Supervised learning.2.Unsupervised learning which is most popular techniques in clustering [30].

H. K-Means Clustering

K-means clustering methods is an unsupervised clustering algorithm, K-stands for a number of clustering it is typically a user input of the algorithm-means algorithm is iterative in nature, clustering algorithm relies on a distance metric data points [12].

K-means clustering is applied to cluster converges. But its finds a local minimum of the cost function. It very quickly implementation and simple feature extraction.

IV. DISTANCE MEASURE TECHNIQUES.

Distance measure is similarity metrics and they are used for comparing the similarity of two images [3]. There are different kinds of similarity measure methods like (i). Euclidean distance, (ii).Histogram intersection (iii).Murkowski distance. (iv).Quadratic distance (v).Manhattan distance (vi).Mahalanobis (vi).Sum of absolute differences (vii). Sum of squared absolute differences (viii) city block differences (ix).Canberra distance (x) .The maximum value, Differences and Minkowski distance [21],[23].there are also more other distance measurements, we can using several methods and several metrics both are using improving performance.

V. COMPARISON OF THE VARIOUS TECHNIQUES.

Here we tabulate the various papers published in reputed journals and discuss the different methods advantages and dis advantages.

S.No	Paper	Feature Extraction Method	Re-Ranking Methods	Distance Measure Method	Advantage	Disadvantage
1	Improving Web Image search by Bag-Based Re Ranking[et al Lixin Duan Num	Low level features such as color, texture and shape.	GMI-SVM	K-means clustering method.	We propose a new bag-based re-ranking framework for	Not using proper similarity metrics.

	2011]				large scale TBIR.	
2	Bayesian Visual Re Ranking [et al Xinmei Tian May 2010]	Low level features, color moments	Bayesian Visual Re-ranking.	Local learning regularize and pairwise ranking distance.	We have proposed combined features methods such as textural and visual information from the visual re ranking.	Not using more Re-ranking models, and distance metrics.
3	Sparse Contextual Activation for Efficient Visual Re-Ranking.[et al Song Bai March 2016]	We implement two features methods 1.Local features 2.Holistic features. SIFT and HSV Histogram.	Sparse Contextual Activation for Visual Re ranking methods.	Jaccard ,TPG,LCDB,SCA Distance metrics are used.	We propose a particularly efficient algorithm called SCA used. They have used lot distance measurement.	They are not using medical images and videos.
4	Tag-Based Image Search by Social Re-Ranking [et al Dan Lu Aug 2016].	This method improving image retrieval results. This system using CG,(correlation graph) and SCC (strongly connected components).	Re-ranking method not used.	Euclidean distance, Rank-Biased Overlap(RBO)	It is Minimizing the human behavior searching results.	It is very complexity system.
5	Combining Visual attention model with multi-instance learning.[et al Songhe Feng 2011]	We have used saliency features extracted.	Tag Re-Ranking.	Tag saliency featured matched.	We have using Effective Algorithm, such as user feedback, minimum effective result.	Saliency features methods are old model.
6	Click-boosting Random Walk for Image search Re ranking [et al Xiaoeng yang Aug 2013]	We proposed click boosting random walk algorithm.	Click boosting re ranking methods.	Visual Similarity measurement.	There are two major steps1.Boost the initial ranked, 2.image graph.	This system not using proper similarity algorithm.
7	A new SVM – based relevance feedback image retrieval using probabilistic feature and weighted kernel function [et al Xiang-Yang Wang 2016]	We have proposed new technology is Circular re ranking approach.	Bag of visual words re ranking method.	NDCG(Normalized discounted Cumulative Gain).	We are combining color, texture, and shape can using image retrieval, SVM classification also used.	It is not using very popular re ranking methods.

8	Neighborhood Matching For Image Retrieval.[et al Ivan Gonzalez-Diaz 2016]	We have developed a geometric method it is called Neighborhood matching. This revisits the key point matching process (Bow).	Neighborhood matching re ranking.	Hamming distances.	This paper explained in Neighborhood matching features found.it focus on the spatial verification step of a spatial or near duplicate image searched.	We can't get effective images.
9	Integration of wavelet transform local binary patterns and moments for content based image retrieval [et al prashant Srivastava 2017]	This methods has focused on combines Local Binary patterns with Legendre moments, they are also using multiple resolutions of wavelets transform coefficients	Not used.	Euclidean distance.	This system has been used very efficiency methods. We are used lot of database images and comparison.	They are using only one similarity measurement.
10	Robust histogram –based image retrieval.[et al Cyril Hoschi [2016].	We offered histogram framework image retrieval allowing to histogram match.	Not used.	Euclidean distance.	To extent high strength to noise.	Very simple and easily methods are used.

Table 1. Comparison of various models

VI. CONCLUSION

In the survey, discusses the various methodologies used for extracting from the CBIR system. We have been discussed combined Re-ranking methods and Distance Metrics (DM) with clustering. Our main techniques focus in reducing the semantic gap between the low-level features and high-level semantic concepts. A discussion of invariant image retrieval under various metrics moments is also made. Our aiming results demonstrate that the proposed method based on color, Texture, Shape features of image sub-blocks has better retrieval performance. As further studies, Distance metrics (DM) and re-ranking also clustering methods. The proposed retrieval method is to be evaluated with other integrated matching techniques. Additional combined survey on an image re-ranking suggest that this all methods can improve the results returned by commercial search engine. Therefore, the future of web image re-ranking methods depends a lot collective focus and overall progress in each aspect of re-ranking technologies. To obtain an efficient Web image re-ranking framework, one must choose the challenge re-ranking methods. Also this survey help in comparing some important web image re-ranking methods.

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