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WEB IMAGE RE-RANKING USING QUERY-SPECIFIC SEMANTIC SIGNATURES WITH DUPLICATE REMOVAL

S.Thillainayaki[1], N.Jayanthi[2]

[1] PG Student, [2] Associate Professor,
Department Of Computer Science and Engineering,
Velalar College of Engineering and Technology,

E-Mail: *thillainayaki42@gmail.com*, *njayanthi1979@gmail.com*

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S.Thillainayaki[1], N.Jayanthi[2]

[1] PG Student, Department Of Computer Science and Engineering,
Velalar College of Engineering and Technology,
thillainayaki42@gmail.com
[2] Associate Professor, Department Of Computer Science and Engineering,
Velalar College of Engineering and Technology,
njayanthi1979@gmail.com

ABSTRACT

Web mining uses the data mining techniques to automatically discover and extract information from web documents/services. Image re-ranking is an effective way to improve the results of web based image search. The challenge in image re-ranking is that the similarities of visual features do not correlate with images semantic meanings of users search intention. In the existing system visual features of images are compared and the semantic spaces of the query keyword are used to re-rank the images. It produce 25% to 40 % re-ranking precision using query specific semantic signature and the duplicates images are not eliminated. The proposed system improves the re-ranking precision by using semantic signatures and hashing technique and the duplicate images are identified and eliminated using similarity algorithms.50% of re-ranking precision may be expected.

Keywords: Similarity algorithms, visual features, Semantic signature.

I. INTRODUCTION

Web mining **-** is the application of data mining techniques to discover patterns from the Web. According to analysis targets, web mining can be divided into three different types, which are Web usage mining, Web content mining and Web structure mining. In web content mining, the content want to search will be clear if not it makes the ambiguity on query keywords and the result will contain irrelevant images as target images. The search intention of the user has been identified by one click feedback Based on the click on image decides intention of the user. after click the image ,the visual features are extracted Based on the visual features ,the similarity images are filtered. The another method is content based image retrieval with relevance feedback. initially the query is posted in to the search engine and the relevant images are displayed. The conventional re-ranking framework has the following steps. the keyword is expanded and the relevant images are displayed. The query image is founded and the visual features are extracted and compared with images. Finally re-ranking done on visual features. This framework has online and offline part. Few popular visual features are in high dimensions and efficiency is not satisfactory if they are directly matched.

II. RELATED WORK

The image re-ranking is to compute the visual similarities that reflects the semantic relevance of images. In[1] The use the power of xml meta-tags worked on the web page to search the queried information. The xml page is Consisted of built-in and user defined tags. The metadata information of the pages is extracted from the xml and the practical results are regarding to the visual similarities.
this xml and the practical results showing that proposed approach taking very less time to answer the queries while providing more accurate information. it use six types of visual features such as Attention guided colorspatialet ,wavelet multi-layer rotation invariant edge orientation histogram, histogram of oriented gradients and GIST, Semantic signature can also be computed from textual features and combined with those from visual features. Use K-means clustering for clustering of image in offline mode.SVM classifier for classification of images.

This Approach Improves efficiency and Visual features of thousands of dimensions can be projected to the semantic signatures as short as 25 dimensions.25%-35% relevant improvement on re-ranking is achieved. Disadvantages is Duplicate image were not removed. In[2] internet image search approach the image features like

Image feature like Attention Guided Color Signature, Color Spatialet, Multi-Layer Rotation Invariant EOH, Facial Feature are considered. It requires the user to give only one click on a query image and images from a pool retrieved by text based search are re-ranked based on their visual and textual similarities to the query image. Google requires a user to select a suggested textual query expansion by one-click to get additional results. The key problem to be solved in this paper is how to capture user intention from this one-click query image. The key contribution is to capture the users' search intention from this one-click query image in four steps.

The query image is categorized into one of the predefined adaptive weight categories, which reflect users' search intention at a coarse level. Inside each category, a specific weight schema is used to combine visual features adaptive to this kind of images to better re-rank the text-based search result. Based on the visual content of the query image selected by the user and through image clustering, query keywords are expanded to capture user intention. Expanded keywords are used to enlarge the image pool to contain more relevant images.

Expanded keywords are used to expand the query image to multiple positive visual examples from which new query specific visual and textual similarity metrics are learned to further improve content-based image re-ranking. These steps are automatic without extra effort from the user. This is critically important for any commercial web-based image search engine, where the user interface has to be extremely simple. Besides this key contribution, a set of visual features which are both effective and efficient in Internet image search are designed. Advantages Interaction is user friendly just by one click. One click feedback decides the user intention efficiently. Disadvantages Ambiguity issues occur, result need filtering. Duplicate images were not removed.

In[3] mapped visual features to a universal The concept dictionary for image retrieval. Query-by-semantic example (QBSE) which is combination of query-by-visual-example (QBVE) and semantic retrieval. the problem of the automatic extraction of semantic descriptors from images, to build models of visual appearance of the semantic concepts of interest. Semantic feature where used which are high level features. All features of image are not consider.

In[4]Visual Rank algorithm Use of Global features like color, histograms and shape. Local features like Harris corners, shape context and Spin Images. The Visual Rank algorithm to find out the visual link structures of images and to find the visual themes forre-ranking. Visual Rank, an end-to-end system, to improve Google image search results on robust and efficient computation of image similarities applicable to a large number of queries and images. novel extension proposed random-walk models have advantage of current progress in image-search and text-based Web search. Visual Rank employs the Random Walk intuition to rank images based on the visual hyperlinks in the images.

In[5] For example google requires a user to select a suggested textual query expansion by one click to get additional results. The key problem in this paper is how to capture user intention from one click query image. the key contribution is to capture the users search intention from this one click query image in following areas. The query image is categorized into one of the predefined adaptive weight categories which reflects users search intention at a coarse level.

III. PROPOSED FRAMEWORK

A. Query Image search

When an image search in search engines, that corresponding images are loaded in that time, meanwhile among them there is a uncategorized images are also spotted. However, producing such databases containing a large number of images and with high precision is still an arduous manual task.

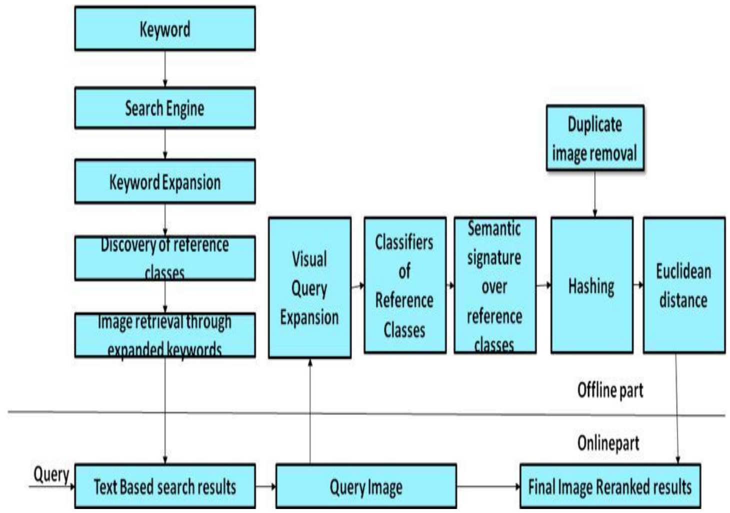


Fig1: System Architecture

Image clusters for each topic are formed by selecting images where nearby text is top ranked by the topic. A user then partitions the clusters into positive and negative for the class. Second, images and the associated text from these clusters are used as exemplars to train a classifier based on voting on visual (shape, color, and texture) and text features. Google image search limits the number of returned images to 1,000, but here, each of the returned images is treated as a "seed"—further images are downloaded from the Webpage where the seed image originated.

The third approach, Google Images includes only the images directly returned by Google image search (a subset of those returned by Image Search). The query can consist of a single word or more specific descriptions such as "penguin animal" or "penguin OR penguins." Images smaller than 120
120 are discarded. In addition to the images, text surrounding the image HTML tag is downloaded, together with other metadata such as the image filename.

Image Search gives a very low precision (only about 4 percent) and is not used for the harvesting experiments. This low precision is probably due to the fact that Google selects many images from Web gallery pages which contain images of all sorts. Google is able to select the in-class images from those pages, e.g., the ones with the object-class in the filename; however, if we use those Web pages as seeds, the overall precision greatly decreases. Therefore, we only use Web Search and Google Images, which are merged into one data set per object class. Table 2 lists the 18 categories downloaded and the corresponding statistics for in-class and non-class images. The overall precision of the images downloaded for all 18 classes is about 29 percent.

B. Query Image Classification

Image Classification had done using the SVM algorithm. the classification and reference classes are generated and re-ranked in offline stage. Compare three different approaches to downloading images from the Web.

The first approach, named Web Search, submits the query word to Google Web search and all images that are linked within the returned Web pages are downloaded. Google limits the number of returned Web pages to 1,000, but many of the Web pages contain multiple images, so in this manner, thousands of images are obtained.

The second approach, Image Search, starts from Google image search (rather than Web search).

C. Visual Query Expansion

The visual query expansion considers the Low level visual features to expand the query. Now describe the re-ranking of the returned images based on text and metadata alone. Here, we follow and extend the method proposed by using a set of textual attributes whose presence is a strong indication of the image content.

The goal is to re-rank the retrieved images.

Each feature is treated as binary: "True" if it contains the query word (e.g., penguin) and "False" otherwise.

To re-rank images for one particular class (e.g., penguin), we do not employ the whole images for that class. Instead, we train the classifier using all available annotations except the class we want to re-rank. This way, we evaluate performance as a completely automatic class independent image ranker, i.e., for any new and unknown class, the images can be re-ranked without ever using labeled ground-truth knowledge **(**images are divided into three categories: 1.Good, 2.Ok, 3.non-class**)** of that class.

D. **Re-Ranking of Images**

QUERY SPECIFIC SEMANTIC SIGNATURES

STEPS

Keyword expansion: keyword q for expansion E(q) for set of images S(q) the expansion e € E(q) visual similarity I €S(q). ranking order r1(w)={T-j $w=w^{j}_{I}$

Over all ranking score r1(w)={T-j $w=w^{j}_{I.}$

Incorporating similarity semantic correlation the images I_a and I_b the similarity is proven using a bilinear form

$$S(I_{a,}I_b)=\sum_{i,j} P^{ai} C^{ij} P^{bj} = P^{aT} P^{b}$$

HASHING METHOD

A reduced Euclidean distance is used to replace the quantization loss of the quantization process. A database *X* consists of n samples: X={Xi}~l' or in the matrix form: *X* E *R dxn*, where *d* denotes the original dimensions. Each column in *X* is a sample *Xi* E *R dx1*which is a feature vector extracted to describe an image, and *qi* E *R dx1* is a querying sample. A hash table with *k* bits is denoted as *H k(x)* = [~(X) ...*hk (x)]* , where *hex)* denotes a hash function that maps the sample *X* into {-I, I} or {O,1}.

E. **Duplicate Identification and Removal**

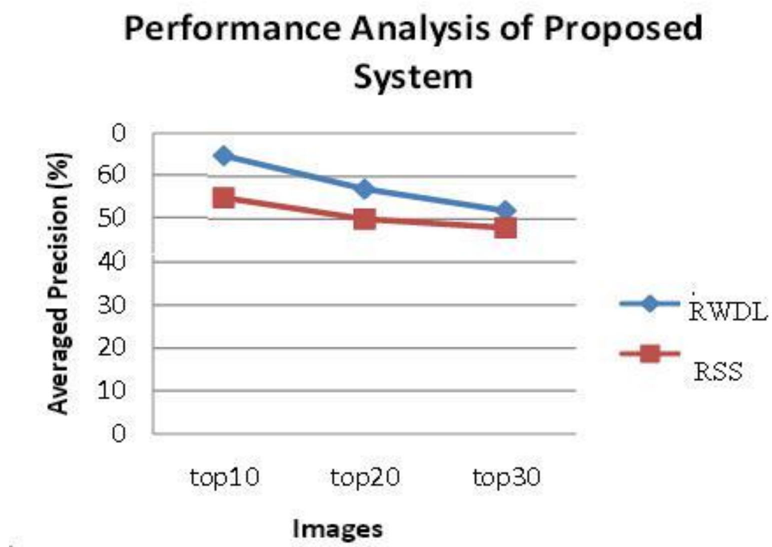
For duplicate image detection fuzzy hash algorithm is used. To find the similarity of images perceptual hashes technique used

Steps:

1. Resize to a common 8x8 size. The fastest way to remove high frequencies and detail is to shrink the image.
2. Grayscale it. This changes the hash from 64 pixels (64 red, 64 green, and 64 blue) to 64 total colors.
3. Compute the mean value of the 64 colors. This is the averaging of the hash.
4. Convert the 64 colors to 64 bits. Each bit is simply set based on whether the color value is above or below the mean.
5. Construct the hash. Set the 64 bits into a 64-bit integer. The order does not matter, just as long as you are consistent.
6. To compare two images, calculate the Hamming distance between two average hashes. A distance of zero indicates that it is Likely a very similar picture (or a variation of the same picture). A distance of 5 means a few things may be different, but they are probably still close enough to be similar. But a distance of 10 or more.That's probably a very different picture.
7. similarity = 1 - (abs(red[img1] - red[img2]) + abs(blue[img1] - blue[img2]) + abs(green[img1] - green[img2])) / 255 * 1024 * 3.

IV. EXPERIMENTAL RESULTS:

Using semantic signature with hashing and the duplicate image detection and removal improves the output 25-70%. In proposed system the result improved. Re-ranking with Duplicate removal(RWDL) and Re-ranking with Semantic Signatures(RSS).



V.CONCLUSION

The query specific semantic signature with hashing is implemented for re-ranking the search results. By comparing the visual similarities of images and using the semantics of the query word the images are re-ranked. The extracted semantic signatures can be70times shorter than the original visual features, which achieves 25-70 percent relative improvement on re-ranking precisions over state-of-the-art methods by the elimination of duplicate images.

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