International Journal of Engineering and Technical Research (IJETR)
ISSN: 2321-0869, Volume-3, Issue-3, March 2015

Query Specific Semantic Signature for Improved Web Image Re-Ranking

Joshith.K, S.Krishnamoorthi

***Abstract*— Web image search, with one click method is adopted by several commercial searches. Image re- raking approach is taken in account for current web based image search .image re-ranking starts with the intake of query keyword and search engine do first retrieve images according to the keyword given. The user now selects an image from the group retrieved and the images will be re-ranked according to users one click. The major challenge is the image with similar visual features cannot be correlated by which the user clicks. Learning of a universal visual semantic Space which depicts the characteristics of images which are highly different to each other is also a difficult task.**

Thus the proposed Approach to overcome the problem is an image re-ranking framework. It has the property of Automatic offline learning. It learns different visual semantic spaces for different query keyword. Thus a semantic signature will be produced by projecting visual features of images to their visual semantic space. At its online stage the produced semantic signature is compared with the images so that images get re-ranked as the semantic signature is obtained from keywords visual semantic space. As a result the proposed image re-ranking framework thus increases accuracy and efficiency of image re-ranking

***Index Terms*— query keyword, re-ranking, semantic signature, visual semantic space.**

I. INTRODUCTION

Web image retrieval starts with keyword queries and the major challenge is that ambiguity in query keyword specified by user. Ambiguity in query keyword produces noisy image search result. For example when “cakes” used as keyword, the image retrieved will fall on different category, cakes of different shapes, stylesetc. Thus image re-ranking methodology has been adopted for better search results.it starts with an intake of a query keyword and a set of images being retrieved then the user selects an image of search intention. The rest images will be re-ranked according to the selected image visual features

Manuscript received March 01, 2015.

Joshith.K is pursuing final year M.Tech in CSE at bharathiyar college of engineering &technology ,karaikal.his research interest incudes data mining and image processing.

S. Krishnamoorthi. Working As Professor And Head Of The Department , Cse At Bharathiyar College Of Engineering &Technology,karaikal.

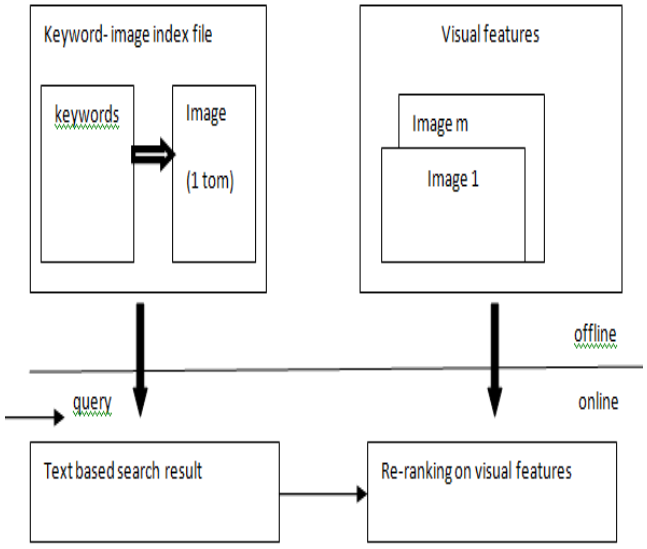

Figure 1 CONVENTIONAL IMAGE RE-RANKING SYSTEM

The problem in image re-ranking is that images having similar low level visual features cannot be correlated with the higher level semantic meaning of image selected by the user. For example if a user search for keyword “apple” the result may of “green apple”, “red apple”etc. if the user then clicks to “red apple” images should be re –ranked according to the semantic of image ,not only its low visual features.ie image should be all of ”red apple ”no images similar by low visual features and diverse in semantics should not be retrieved. The other challenge is that it is hard to learn a universalvisual semantic space for characterizing highly diverse images as the image database grow big in web.

II. RELATED WORK

Internet image retrieval starts by text based image retrieval technic . In which image will be labeled with different number of text keywords that are linked with image and also helps its retrieval when the user search in web. Text based image retrieval starts with matching the keywords that are linked with images in data base and query keywords text. Thus the matched images are retrieval and shown to user. As the imaged data base grows bigger it will be hard for the technical people to label images that each images can be in different sector for example image of a “pen” can be labeled as under its type, its company and so on thus when each image can have different labels to identify them. If the image data based increase, its hard for work with labeling for efficient search results.

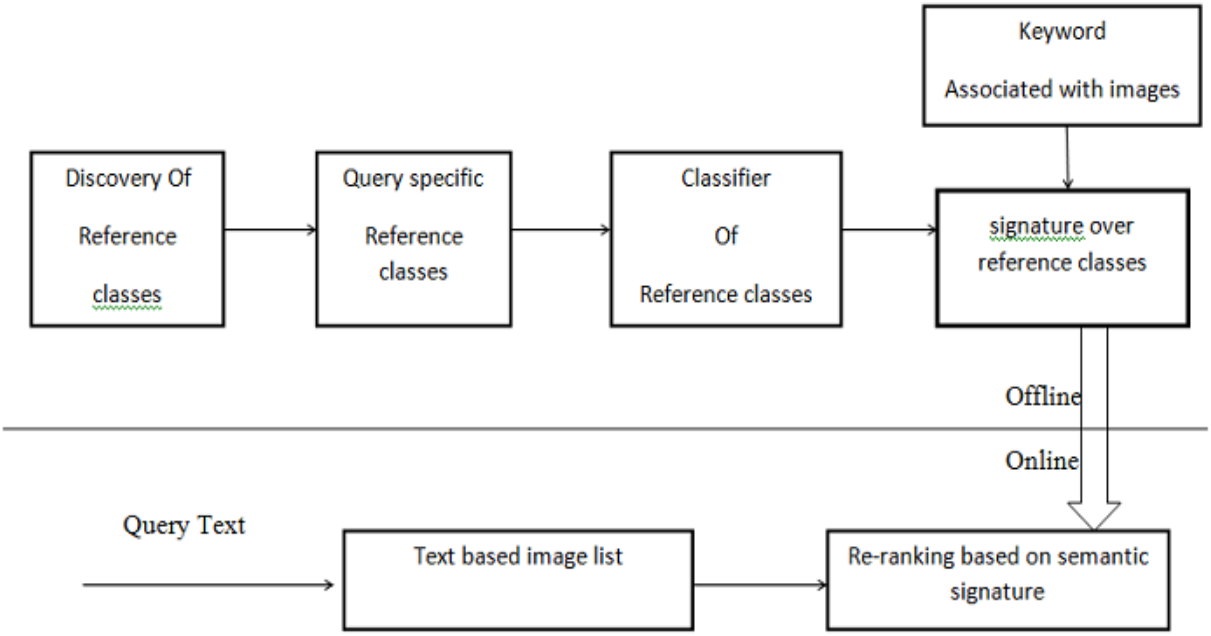

Figure 1 IMAGE RE-RANKING USING SEMANTIC SIGNATURE

For the improvement by solving problems in text based retrieval, the next stage of image retrieval the content based image retrieval (CBIR) is introduced which has a self learning capability to interconnect images .Images that are retrieved by the search will be based on the content which labeled manually. As the images data base increases it become impractical to label all available images manually. Not only labeling images makes the technique impractical but also connecting similar images. So that, they can be retrieved easily CBIR.

Low level features like color texture are taken in to account normally to predict similar images. This method can not be efficient as it gives a semantic Gap between lower level features and higher level features (User Intention). Short term learning and long time learning approaches are used for the reduction of semantic gap between low level features and high level features. Short term learning helps in learning the list of images relevant with the user query keywords. On the other hand the long term learning helps in learning connection between images form the short term learning technique. From keeping learned information from previous queries.

The content based image retrieval is more efficient then text based image retrieval system. Still it lacks in finding user intention for search and provide user without noisy search results. The defects of CBIR is overcomes by the next method called one click internet image search. This method helps in clearing the ambiguity in image retrieval. This isan approach in which the text based and CBIR involves and an additional visual features which helps in learning the user intention. So that images are retrieved as per user intention. The method of learning user intention by one click is started by text based image retrieval where a list of images will be retrieved and it uses the CBIR methodology too still the retrieved images won't be fully what the user in need. As it can be said, images retrieved contains some noisy data (from the base of user intention). So the last stage includes learning from user intention by providing option of one click. The major challenge of this method is that similar visual featured images does not connectwith the image clicked by user

III. System Architecture

The proposed system consist of a framework for image re-ranking.it have the capability to learn different visual semantic spaces for different query keywords the learning process is done automatically and it does not keep a universal concept dictionary. the query keyword itself helps in narrowing semantic space of images that are to be re-ranked.for example the keyword is "blackberry" the concepts like "cars","bikes" can be avoided and concepts like "mobile phone","fruit"can be taken in account. These relevant concept can be made use for learning visual semantic space of "blackberry", thus the nonrelavent concept can be avoided and the visual semantic space will be accurately modeled. Those nonrelavant concepts will be always noisy and it takes the accuracy of re-ranking down.

The next stage is that the visual features of images will get projected to their respective visual semantic spaces and the produced output will be semantic signatures. This produced semantic signature of the given query keyword will be compared with other images and are re-ranked.

Proposed system architecture is shown in fig2.it consist of two phases named online and offline.in the offline stage for a query keyword "blackberry" the most relevant concept that matches the keyword will be automatically selected. concepts like "fruit","mobile phone" are selected as relevant concept by considering visual and textual information a reference class is developed, which contains a

set of keyword expansion. For the automatical obtaining of training examples these relevant concept ("fruit") is used to retrieve images. Thus the retrieved images by keyword expansion will have less difference with images retrieved by query keyword "blackberry". this stage also performs removal of noisy data and also redundant reference class. For example "blackberry mobile", "blackberry mobile models" comes under same reference class.

Every query keyword will have a multiclass classifiers on low level visual features stored. Each image in the database will be relevant to different keyword according to word image index file. Now we have an multiclass classifier of reference class and word image index file. The visual features of image and reference class of keyword is compared using classifiers which are stored earlier. And thus the semantic signature is extracted.

Now at the frameworks online stage user inputs the query keyword.as all images in the database will have its own semantic signature will be retrieved first. Now the user clicks on his intent image, its semantic signature will be compared with semantic signature of other images and image search result will be re-ranked.

The semantic signature developed has the property to project thousand dimensions of original visual features in to twenty-five dimensions. Thus it improves the result of web image re-ranking. It has the advantage that the visual features of similar images can be correlated to the semantic meaning of image which user selects.

IV. Discovery Of Reference Classes

A. *Keyword Expansion*

For a keyword 'q' its reference class can be determined by a set of expansion of 'q'.ie S(q) which is more similar to'q' and is the super set of 'q'.To find the reference class ,a set of images I(q) is retrieved taken 'q' as query keyword. The retrieved images will be linked with different words .these words makes 'k' the keyword expansion and 'k' € S(q)will appear in I(q).

B. *Training Images Of Reference Class*

Training images of reference class is obtained automatically. The process is that the result from the keyword expansion 'k' is taken as query keyword and top 'm' images are taken as training images. The keyword expansion 'k' will have less ambiguity to 'q' semantically to retrieved images will not be highly divers to each other.

C. *Redundant Reference Classes*

Keyword expansion of "blackberry "as "blackberry mobiles "and "blackberry mobile models" are both visually and semantically same. To identify these kinds of redundant classes half of the data in both class is taken and SVM classifier is used to classify next half. If it is possible to classify both half easily then it is proven that both classes are not the same

V. Conclusion

The framework for web image re-ranking based on query specific semantic signature improves the method of web image re-ranking. It uses semantic signature which is produced by projecting visual features of images to their visual semantic space. The semantic signature which is obtained from keywords and user intent image semantic space will be compared to the semantic signature of other images at online stage. So that images will be re-ranked .thus it increases the accuracy and efficiency of web image re-ranking

REFERENCES

[1]xiangang wang,kr lie,xiaoou tang.*web image re-ranking using query specific semantic signatures* IEEE transactions on patterns analysis and machine intelligence(volume:36,issue:4) april 2014

[2]siddangowda.g.r,santhosh.s,sandeep kumar.s, raghu m.t. *image retrieval using semantics of query image.*international journal of darshan institute on engineering research & emerging technologies.vol.2,no.2,2013

[3]xiaoou tang,ke liu,jimgyu cui,fang wen,xiaogang wang.*intent search:capturing user intention for one-click internet image search. signatures* IEEE transactions on patterns analysis and machine intelligence(volume:34,issue:7) july 2012

[4] E. Bart and S. Ullman. *Single-example learning of novel classes using representation by similarity*. In Proc. BMVC, 2005.

[5] Y. Cao, C. Wang, Z. Li, L. Zhang, and L. Zhang. *Spatial-bag-offeatures*. In Proc. CVPR, 2010.

[6] G. Cauwenberghs and T. Poggio. *Incremental and decremental support vector machine learning.* In Proc. NIPS, 2001.

[7] J. Cui, F. Wen, and X. Tang. Intentsearch: *Interactive on-line image search re-ranking.* In Proc. ACM Multimedia. ACM, 2008.

[8] J. Cui, F. Wen, and X. Tang. *Real time google and live image search re-ranking*. In Proc. ACM Multimedia, 2008.

[9] N. Dalal and B. Triggs. *Histograms of oriented gradients for human detection.* In Proc. CVPR, 2005.

[10] C. Lampert, H. Nickisch, and S. Harmeling. *Learning to detect unseen object classes by between-class attribute transfer*. In Proc.CVPR, 2005.

[11] D. Lowe. *Distinctive image features from scale-invariant keypoints. Int'l* Journal of Computer Vision, 2004.

[12] B. Luo, X. Wang, and X. Tang. *A world wide web based image search engine using text and image content features*. In Proceedings of the SPIE Electronic Imaging, 2003.

[13] J. Philbin, M. Isard, J. Sivic, and A. Zisserman. *Descriptor Learning for Efficient Retrieval.* In Proc. ECCV, 2010.

[14] N. Rasiwasia, P. J. Moreno, and N. Vasconcelos. *Bridging the gap: Query by semantic example.* IEEE Trans. on Multimedia, 2007.

[15] M. Rohrbach, M. Stark, G. Szarvas, I. Gurevych, and B. Schiele. *What helps wherevand why? semantic relatedness for knowledge transfer*. In Proc. CVPR, 2010.

[16] Y. Rui, T. S. Huang, M. Ortega, and S. Mehrotra. *Relevance feedback: a power tool for interactive content-based image retrieval.*IEEE Trans. on Circuits and Systems for Video Technology, 1998.

[17] D. Tao, X. Tang, X. Li, and X. Wu. *Asymmetric bagging and random subspace for support vector machines-based relevance feedbackin image retrieval*. IEEE Trans. on Pattern Analysis and Machine Intelligence,2006.

[18] Q. Yin, X. Tang, and J. Sun. *An associate-predict model for face recognition.* In Proc. CVPR, 2011.

[19] X. S. Zhou and T. S. Huang. *Relevance feedback in image retrieval: A comprehensive review*. Multimedia Systems, 2003.

BIOGRAPHICAL NOTES

Joshith.K is pursuing final year M.Tech in CSE at bharathiyar college of engineering &technology ,karaikal.his research interest incudes data mining and image processing

S. Krishnamoorthi. Working As Professor And Head Of The Department , Cse At Bharathiyar College Of Engineering &Technology,karaikal