Web Information Retrievals: An Excellent Image Portal with Automated Hidden Tag to Image

K.Sankar
Research and Development Centre,
Bharathiar University
Coimbatore, India
kilandaisankar@gmail.com

G.N.K.Suresh Babu
Department of Computer Applications
Acharya Institute of Technology
Bangalore, India
gnksureshbabu@gmail.com

***Abstract*— The main goal of our research is to invent a new Web Image Search Portal with more innovation. We aim to search and retrieve the matched images from the uploaded online images with the help of Auto hidden tag method using the RANSAC algorithm through Open Computer Vision. We implemented a new system using the object detection process in an image using the openCV technique. When a user posting their images, if they forget to comment on all the objects present in the image also our proposed system will detect all the object present in the image using object detection algorithm, then this object will be extracted from the image and recognized with large dataset by using RANSAC algorithm. This system will be very useful to the end user in required image retrieval process, even images which are not labeled or tagged by the upload user also retrieved in this system. Auto hidden tagging process with visual feature extraction and the comparison is the main technique used in this system.**

Keywords—Auto Hidden Tag; Tag Images; Portals; Information Retrieval; Online and Offline Process

I. INTRODUCTION

Nowadays most of the internet gauge image search engines use only text information. Usually the end users type keywords in the hope of finding a certain type of images [4], [5]. We introduced an effective Image Portal with this paper. The previous retrieval system supports new real-time image searches without re-ranking systems, which returns including noisy data and information. The main objective of this work is to provide an efficient web image Search engine which uses Tag based search in online process and image visual feature extraction technique and auto-tagging process in offline. Text tag-based image search is the fastest search process, most of the images uploaded by the user are not properly tagged, and sometimes without the tag, they upload the image. These images are not retrieved in text tag search process to overcome this auto hidden tagging process is going to find in this system. The auto-tagging process requires visual feature extraction and comparison techniques. In this paper, we propose to found an efficient Image Portal. Experimental results display our method and make reliable developments over than Content Based Image Retrieval, Tag, and Re-ranking search as well as a method. Hence the search user never misses any of images with respect to their query search and effective search with high secure.

II. BACKGROUND

In our current work, we extend our previous study by Web Information Retrievals through RANSAC Algorithm on Open Computer Vision [9]. We use the same methodology of combining Image uploading by the offline process and Image searching by online process. In this section, we review the main concepts underlying this methodology. We describe how these given below techniques can be performing efficiently with innovative to find the best outcomes with the help of Auto Tag method.

A. Problem Definition

Many types of research are going on Web Image Re-ranking, which is a combination of both tag and CBIR based image retrieval, Given a query keyword, a pool of images are first retrieved 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. The problem in this system is there is a web image without a tag, then that image is not retrieved in image re-ranking system. To overcome this problem the proposed system has an auto-tagging process when a user uploads the image into the web, the image objects are extracted and their visual features are compared with predefined object features and if there is a match then the auto tag process will add a corresponding hidden tag to the image. When the user tries to receive the image by query word then the query word will be compared with hidden tags and posted tags, based on the tag match either in post tag or in hidden tag the image will be retrieved and displayed to the search user.

B. Survival Analysis

Xiaogang Wang proposed a different approach, the proposed query semantic signatures significantly improve both the accuracy and efficiency of image re-ranking [1]. (2014). the original visual features of thousands of dimensions can be projected to the semantic signatures as short as 25 dimensions. Experimental results show that 25-40 % relative improvement has been achieved on re-ranking precision compared with the state of the art methods. Y. Rui, T. S. Huang, M. Ortega, and S. Mehrotra. Sung Ju Hwang Kristen Grauman proposed an unsupervised approach to learning the connections between human-provided tags and visual features and showed the impact of accounting for importance in several retrievals and auto-tagging tasks [3] (2012). The key novelty is to reveal implied cues about object importance based on how people

978-1-5090-3770-4/16/$31.00©2016 IEEE

naturally annotate images with text and then translates those cues into a dual view semantic representation. Their results using natural language data are promising, and they suggest that the simple rank based cues can also play a role for learning with free form descriptions. In future work, we plan to explore more elaborate feature extraction for natural language annotations.

Jun Yue, Zhenbo Li, Lu Liu, Zetian Fu, the paper implemented a CBIR system using color and texture fused features [4] (2011). Similar images can be retrieved quickly and accurately by inputting an image. More low-level features such as shape and spatial location features etc. will be used to make the system more robust in the future. The image feature matching method and semantic based image retrieval are the other two important aspects of the CBIR system. Samuel Rota, Massimo Rabbi, and Marcello Pelillo proposed a novel approach to CBIR with relevance feedback, which is based on the random walker algorithm introduced in the context of interactive image segmentation [5] (2011). Relevant and non-relevant images labeled by the user at every feedback round are used as "seed" nodes for the random walker problem. Each unlabeled image is finally ranked according to the probability that a random walker starting from that image will reach a relevant seed before encountering a non-relevant one and this method produced results after 6th RF round (80%). Their method is easy to implement, it has no parameters to tune and scales well to large datasets. Extensive experiments on di□erent real datasets with several image similarity measures have shown the superiority of the proposed method over di□erent recent approaches. The literature review we are done about these three methods of Re-Ranking, CBIR and Tag, briefly given in this Section. Section III gives the detailed information about the proposed method with Algorithm. Section IV presents the Experimental results such as Comparison between Normal Tagging and Auto Hidden Tagging method with different Images. The conclusion is concluded in Section V.

C. Scope of Work

A user can able to register in the portal and able to upload Images. When Images are uploaded, an object in the images are extracted and using visual feature extraction technique the object will be identified, based on the identification hidden tags are added to the image. When the user is searching for the image, he has to provide query word which is compared with image hidden tags as well as post content given by the user and more relevant images are retrieved. To identify the object set of images or image features should be maintained in server DB.

III. PROPOSED METHOD

This system has two processes, one is Offline process and another is the online process. The Offline process involved in activities when the user uploads an image in the Portal and the online process involved when a user is providing search keyword & getting the search image.

A. Web Image Information Retrieval

According to this algorithm, we determined the retrieval of matched images from a large amount of Image database then the retrieved images are matched with the help of query word search process [11]. Originally it reads the Input Query Word as per the user was given. IQW checks with Auto Hidden Tags of all the postings and shortlists the matched post.

B. Offline Process

When the user uploads an image he has to provide the image but he may or may not provide comments about the image. In this process, there is an object detection technique. This process will identify the objects in the image and extract it separately. The next step is visual feature extraction, for the entire object extracted in the previous step, a visual feature is generated & generated visual feature are compared with pre-stored object feature in the server. Based on comparison result the object identification happens. Once the object is identified auto tagging process will select corresponding tag names and link with images which are called hidden tags or auto tags (Fig.1).

1) Object Detection using Gaussian Blur and Gaussian Filtering

Algorithm 1: Object Detection

Method: Gaussian Blur / Gaussian Filtering to smooth the image

1. **Input:** Image, Message
2. **Initialize:** Color conversion uses RGB ↔ GRAY and RGB ↔ HSV functions
3. **Output:** Based on above functions result it uses ADAPTIVE_THRESH_MEAN_C, & ADAPTIVE_THRESH_GAUSSIAN_C to detect the object.

The above algorithm is used to detect Object using Gaussian Blur and Gaussian Filtering to smooth the image for Color conversion, this system uses RGB ↔ GRAY and RGB ↔ HSVfunctions based on above functions result it uses ADAPTIVE_THRESH_MEAN_C, & ADAPTIVE_THRESH_GAUSSIAN_C to detect the object with the help of this algorithm.

2) Identify object using visual feature

Algorithm2: Identify object

1. **Input:** Select the Stored Object (SSO) which has High Score and let the score is HS.
2. **Initialize:** High Score ← HS
3. **If** (HS >= Threshold) **then**
4. Print (“object is similar to SSO”)
5. **Else**
6. Print ("No Match")
7. **Output:** Extracted features are acknowledged.

Object Feature Extraction and Feature Comparison for this function we are using RANSAC algorithm [9].This algorithm will extract the Features from the object

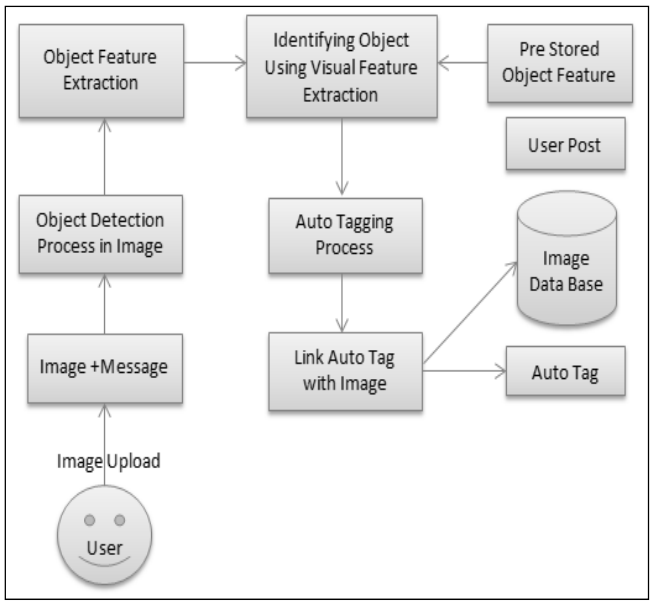

Fig .1. Image upload by Offline process

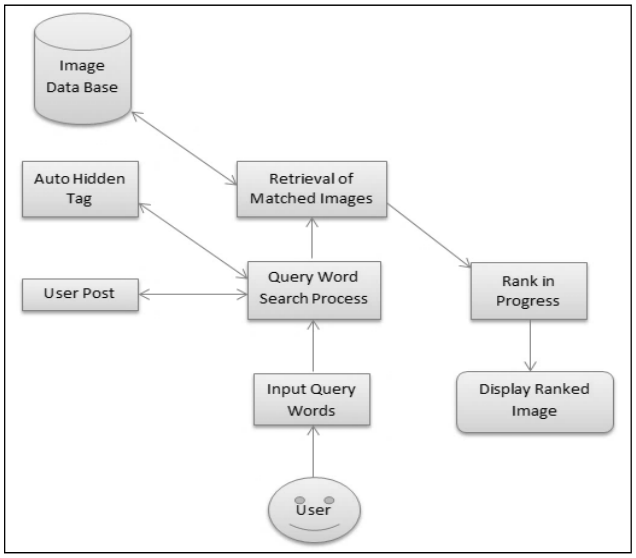

Fig .2. Image search by online process

and compare the features with stored objects and gives the matching score for each stored object. Input: Select the Stored Object (SSO) which has High Score and let the score is HS. Initialize the High Score then If HS greater than or equal to threshold then print the object, else no matches then extracted features are acknowledged.

3) Auto tag Generation using Object Detection Process

Algorithm3: Auto Tag Generation Process

1. **Input:** Input Image, Post, User Id
2. **Method:**Identify the Objects by Object Detection Process
3. **Initialize:** N ← Number of objects detected in the Image.
4. M ← Number of Stored Objects
5. **While (**empty ←Auto Tag) **do**
6. **For** I = 1 to N
7. **Read** "Ith object"
8. **For** J = 1 to M
9. Compare: Ith object with Jth stored object // Using SURF algorithm
10. **Let** X ← feature match score
11. Store X linked with J
12. **Next** J then Shortlist highest score HS
13. **If** (HS >= Threshold) **then**
14. Auto Tag = Auto Tag + Jth Obj.Classification Name
15. **Next** I
16. **Output:** Store the Input Image, Post, and Auto Tag in User Transaction Table.

Rendering to our research work, the Creation of auto tag Generation initially Read the Input Image, Post, User Id Using Object Detection Process identify the Objects. Let assume N be the Number of objects detected in the Image and M be the Number of Stored Objects. Then Initialize Auto Tag is empty whether it is empty means For I = 1 to N then Read the Ith object. Similarly, For J = 1 to M Using SURF algorithm compare Ith object with Jth stored object Let the feature match score is X. then Store X-linked with J, Next J. Shortlist the highest score HS if HS is greater than or equal to Threshold then Auto Tag = Auto Tag + Jth Object Classification Name, Next I. Finally, Store the Input Image, Post, and Auto Tag in User Transaction Table for future enhancements.

C. Online Process

In this process, the user has to provide query words for which he wants to retrieve the image. The query words are usually searched with the comments which are inputted by the user during upload process whereas in this system query words are do search process with auto tags and user comments. Based on matched tags corresponding images are retrieved. Then the retrieved images are undergo ranking process and based on ranks images are displayed as a search result to the query user (Figure 2). Giving to our Research work the algorithm, Initially, Read the Input Query Word (IQW) after reading the IQW to Check the IQW with Auto Tags of all the postings and shortlist the matched posts - MP1 and Check the IQW with Comments of all the postings and shortlist the matched posts - MP2. Then MP2 remove the posts which are available in MP1Based on the Object detection matched scores, rank the posts in MP1. Concatenate MP1 and MP2 and prepare display list (DL) and Retrieve the Post in DL. Finally, align and show the post to the users (Algorithm4).

1) Searching Image by Online Process

Searching Image by online system initially Read the Input Query Word and it performs Checking operations with the IQW consequently Auto Tags of all the postings and shortlists the matched posts - MP1 similarly, Check the IQW with Comments of all the postings and shortlist the matched posts – MP 2. In MP2 remove the posts which are available in MP1 is based on the Object detection matched scores, rank the posts in MP1.

TABLE - 1 EXPERIMENTAL RESULT ANALYSIS

Category	Total Images	Tag Search Retrieval	Automated Hidden Tag Search Retrieval
Ball	10	4	10
Bat	10	5	8
Laptop	10	3	7
Helicopter	10	5	9
Average	**10**	**4.25**	**8.5**

Then, Concatenate MP1 and MP2 and prepare Display List (DL) and Retrieve the Post in Display List from the Image Database then finally align and show the post to the users through the Rank in progress.

Algorithm 4:Image Search

1. **Input:** Read the Input Query Word (IQW)
2. Check the IQW with Auto Tags of all the postings and shortlist the matched posts - MP1
3. Check the IQW with Comments of all the postings and shortlist the matched posts - MP2
4. MP2 removes the posts which are available in MP1.
5. Based on the Object detection matched scores, rank the posts in MP1
6. **Concatenate:** DL ← ("MP1" +"MP2")
7. **Retrieve**: Post in DL
8. **Output**: Align and show the post to the users and stop.

IV. Experimental Result

This section proceeding about methodology and the implementation of proposed system. The main objective of this work is to retrieve more relevant images through automated hidden tag approach. In web information retrieval system the image search user to give query keywords as an input, it finds the relevant image as the output. The input image and predefined object features are compared by using SURF algorithm (Algorithm 3). The performance of proposed approach can be evaluated by comparing with the normal tag search versus automated hidden tag search algorithms [1]. The proposed scheme is tested using Automated Hidden Tag search image retrieval from the web and these methods implemented while the user uploading the images through the Offline process.

$$\text{AHT Accuracy} = \begin{cases} 1, \text{Retrieved Images} = \text{Predefined Images with AHT} \\ 0, \text{ Else} \end{cases}$$

We evaluate the performance of the proposed implemented Portal using automated hidden tagging method while searching image from the web. The evaluation is done by using the Accuracy and Recall measurement. The Accuracy is defined as the number of images are retrieved, divided by the total number of retrieved images.

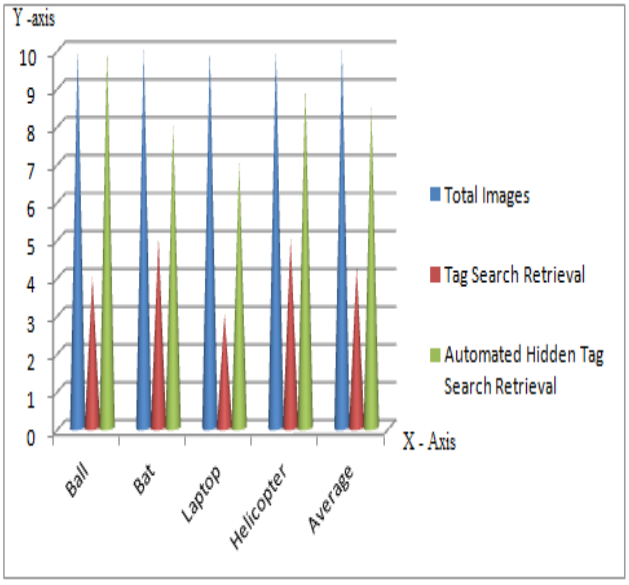

Fig .3. Performance Analysis: Tag vs. Auto Hidden Tag Search

The Automated hidden tagging procedure is evaluated by examining if the original correct annotation has been extracted or not. This accuracy test analysis is applied only on retrieved images that are considered to be useful.

$$\text{Accuracy} = \frac{(\text{Auto Hidden Tagged Images} \quad \text{No.of Retrieved Images})}{\text{Total No.of Retrieved Images}}$$

Table 1 explains the performance and experimental result analysis of uploaded total images with different categories with automated hidden tag method are implemented with these images while uploading in the offline. Automated hidden tagging method takes the image as Helicopter, Laptop, Bat and Ball it compared with predefined object features, so it produces better accuracy than the Normal tag search process, which is the accuracy in automated hidden tag-based image information retrieval is 85%. We implemented comparative analysis for Tag search versus automated hidden tag search. According to the experimental analysis, the proposed system has a better performance rather than the existing system (Figure 3).

V. Conclusion

In this paper we determine, Auto hidden tagging method with images which are not labeled or tagged by the upload user also retrieved in this system. Auto tagging process with visual feature extraction and comparison is the primary technique used in this system. In this methodology plays a very important role in web image information retrieval systems.

Acknowledgment

This work is a part of our Research effort and the authors would like to express thanks, the reviewers for their in-depth and valuable comments and suggestions which have helped to get better the manuscript in several ways.

References

[1] Xiaogang Wang, Member, IEEE, Shi Qiu, Ke Liu, and Xiaoou Tang, " Web Image Re-ranking Using Query-Specific Semantic Signatures". IEEE Transactions on Pattern Analysis and Machine Intelligence, April 2014.

[2] Yashaswi Verma and C. V. Jawahar, "Image Annotation Using Metric Learning in Semantic Neighbourhoods", in ECCV (European Conference on Computer Vision), Report No: IIIT/TR/2012/-1.

[3] Sung Ju Hwang·Kristen Grauman, "Learning the Relative Importance of Objects from Tagged Images for Retrieval and Cross-Modal Search", Int J Comput Vis (2012) 100:134–153 © Elsevier Ltd.

[4] Jun Yue, Zhenbo Li, Lu Liub, Zetian Fu, "Content-based image retrieval using color and texture fused features",MathematicalandComputerModelling54(2011)1121–1127.

[5] Samuel Rota, Massimo Rabbi and Marcello Pelillo, "Content-Based Image Retrieval with Relevance Feedback using Random Walks", IEEE Pattern Recognition, June 6, 2011.

[6] R. Datta, D. Joshi, and J. Z. Wang, "Image retrieval: Ideas, influences, and trends of the new age," ACM Computing Surveys, 2007.

[7] A. W. M. Smeulders, M. Worring, S. Santini, A. Gupta, and R. Jain, "Content-based image retrieval content-based image retrieval," IEEE Trans. on PAMI, vol. 22, p. 1349, 2000.

[8] Y. Rui, T. S. Huang, M. Ortega, and S. Mehrotra, "Relevance feedback: a power tool for interactive content-based image retrieval," IEEE Trans. on CSVT, 1998.

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

[10] D. Tao, X. Tang, X. Li, and X. Wu, "Asymmetric bagging and random subspace for support vector machines-based relevance feedback in image retrieval," IEEE Trans. on PAMI, 2006.

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

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

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

[14] C. Lampert, H. Nickisch, and S. Harmeling, "Learning to detect unseen object classes by between-class attribute transfer," in Proc. CVPR, 2009.

[15] P. M. Panchal, S. R. Panchal, S. K. Shah, "A Comparison of SIFT and SURF ", International Journal of Innovative Research I n Computer and Communication Engineering Vol. 1, Issue 2, April 2013.