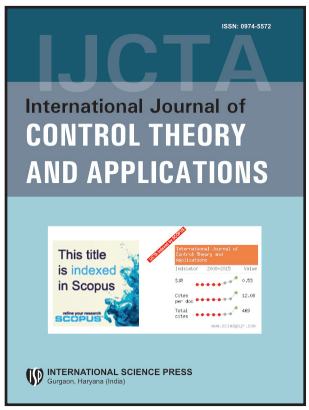

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Implementation of Web Image Information Retrieval through Proficient Portal with ACA Algorithm

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Abstract: This paper focuses and implementing an efficient Image portal through Automated Concealed Annotation algorithm is also known as Automated Hidden Tagging and chained with Hash code for strengthening the weight of security of the Images. In particular, we emphasize prominent Image portal for development, efficient and speedier web Information retrieval system. Text Tag based image search and retrieval is the fastest search process but most of the images uploaded by the user are not properly tagged, sometimes they upload the images without a tag, these images are not retrieved. Recent survival analysis has shown that normal tags are frequently unreliable and unpredictable; consequently, we implemented a new Image portal with ACA methodology to overcome this problem. So, the series of actions and process is necessary to efficiently carry out best results in the proposed system.

Keywords: Automated annotation, ACA algorithm, image search, web image, web technology, image portal, online and offline process.

1. INTRODUCTION

Web information retrieval system especially Image retrieval is the young and fast-growing field of Data Mining. We observe data mining can be viewed as a better result of the web technology. [4] We focus on issues relating to the web image information retrieval on Data mining techniques. [5] Nowadays, web image searching and retrievals are necessary for human life for many activities. Web Image Search is a challenging area, where there is lots of scope for research. Image Search faces two problems most of the time required images are not displayed in the search result and while using a CBIR technique it consumes more time to produce the result. There are many image portals like flicker, shutter stock, iPhoto stock, etc. in a day thousands of images are uploaded and keep increasing. These portals need a powerful Image Search Engine otherwise, the user will lose their interest in image searching. We propose a new algorithm for solving this existing problem. This motivated to provide quality image search result in short time.

2. BACKGROUND

The techniques and algorithms presented are of practical experiment. Algorithms presented in this paper are illustrated in pseudo code. The pseudo code is similar to the java programming language.

A. Survival Analysis

Xiaogang Wang. [1] (2014) propose a different approach, the proposed query-specific semantic signatures significantly recover both the precision and efficiency of image re-ranking method. The original visual features of thousands of sizes can be proposed to the semantic monograms as small 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. [14] Proposes a relevance feedback based interactive retrieval approach, which selectively takings into explanation the above two characteristics in CBIR. During the retrieval process, the user's high-level query and perception subjectivity are taken by animatedly updated weights based on the user's feedback. The experimental analysis result is crossover more than seventy thousand images display that the proposed methodology greatly reduces the user's effort of composing a demand and captures the end user's facts was essential extra indeed. Samuel Rota Bul`o, Massimo Rabbi and Marcello Pelillo [5] (2011) proposed a method, which is easy to implement; it has no parameters to tune and scales well to large data sets. Extensive experiments on different real data sets with several image similarity processes have exposed the advantage of the proposed method over different recent approaches.

B. Problem Statement

Many types of research are going on Web Image Re-ranking [1], [5] 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. [7] By asking the user to choose a query image from the pool, rest of the images are re-ranked based on their visual similarities with the query image. [2] The problem in this system is there is a web image without the 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 to 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 user try 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 use.

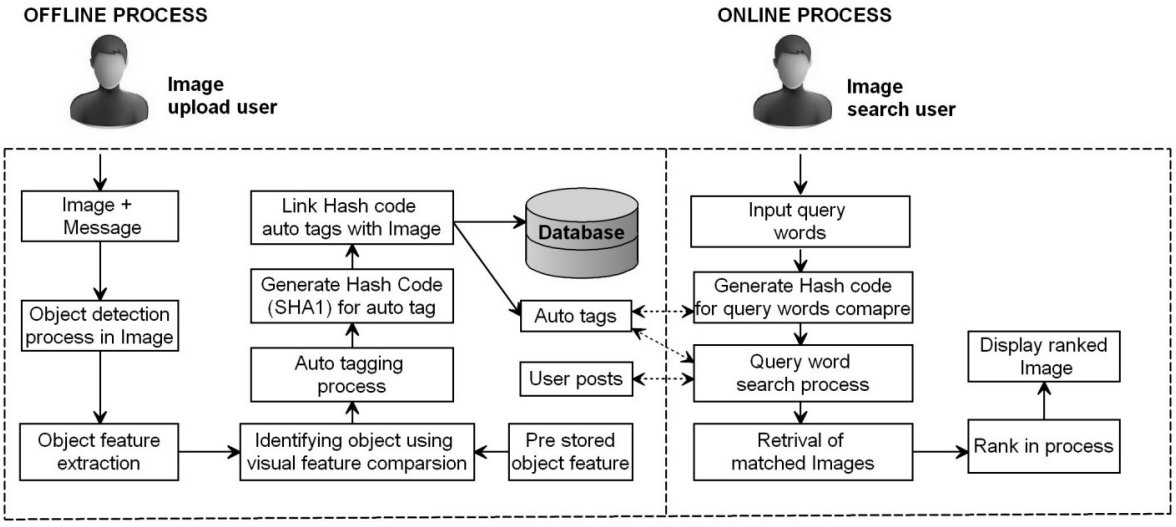

Figure 1: Functional Architecture of Proposed System

C. Motivation of Research

This system is going to develop on web technology. There will be an Admin user how is responsible for Portal settings and Portal Management. 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 Database.

3. PROPOSED APPROACH

This method has two processes, one is an Offline process and another is an online process. The Offline process involved in activities when the user upload an image in the Portal and the Online process involved when a user is providing search keyword & getting the search image (Figure 1).

A. Offline Process

When the user uploads an image he as to provide an image but he may or may not provide comments about the image. In this process, there is an object detection technique. This 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, the 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 object is identified auto tagging process will select corresponding tag names and link with image which is called hidden tags or auto tags.

B. Online Process

In this process user as to provide query words for which he wants retrieve the image. The query words are usually search with the comments which are inputted by the user during upload process where as 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.

C. Object Detection and Feature Extraction

Object detection is the process of discovery instances of real-world objects such as faces, Vehicles, and hidden images or videos. An object detection algorithm usually uses extracted features and learning algorithms to distinguish examples of an object category. It is commonly used in applications such as image retrieval, security, surveillance, and automated vehicle parking systems. The method is Gaussian Blur and Gaussian Filtering to smooth the image. Input keys are Image, message and initialize the color conversion uses RGB ↔ GRAY and RGB ↔ HSV functions. Then the Output is based on above functions result it uses ADAPTIVE_THRESH_MEAN_C, & ADAPTIVE_THRESH_GAUSSIAN_C to detect the object. Identify object using visual feature extraction, the inputs are Select the Stored Object (SSO) which has High Score and let the score is HS, then initialize the High Score <– HS, If the HS >= Threshold then print "object is similar to SSO" else print "No Match" then final output is extracted features are identified.

4. ACA ALGORITHM IMPLEMENTATION

Automated Concealed Annotation Algorithms is also known as Automated Hidden Tagging method, initially Read the Input Image that is Post and 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 Automated concealed Tag is empty whether it is empty means for I = 1 to N then Read the I^{th} object. Similarly, for J = 1 to M Using surf algorithm compare I^{th} object with J^{th} 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 + J^{th} Object Classification Name, Next I. Finally, Store the Input Image, Post, and Auto Tag in User Transaction Table for future enhancements.

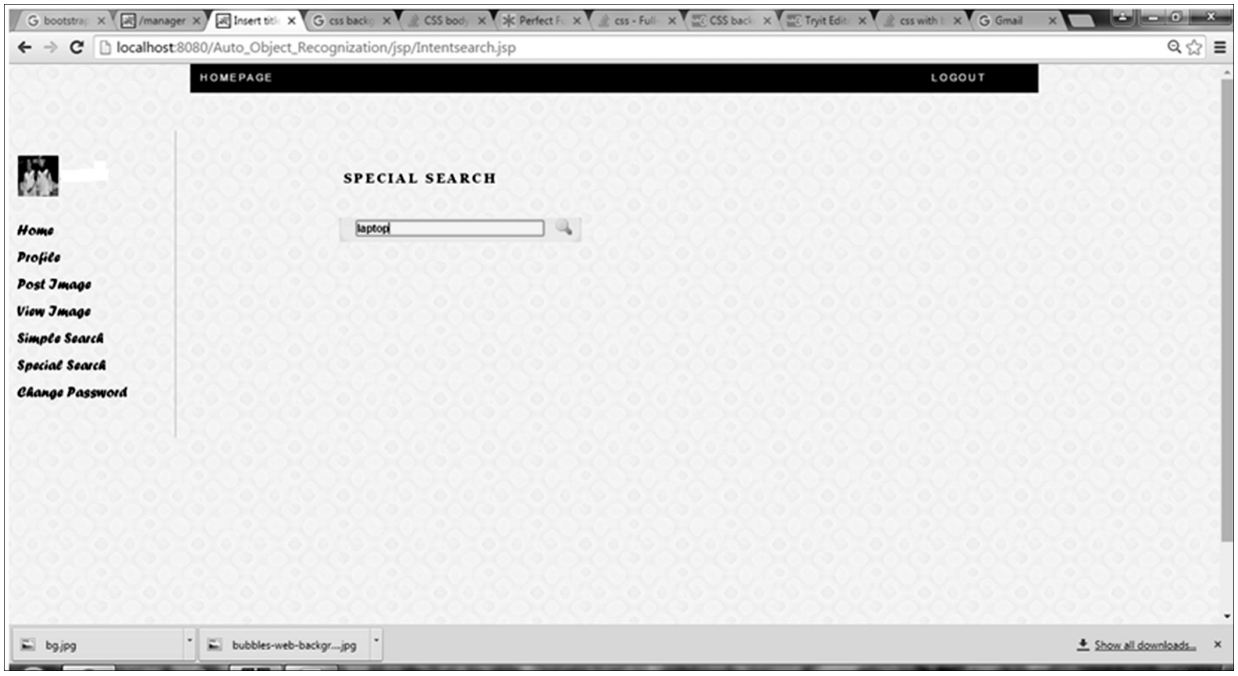

Figure 2: Input Query of Proposed System

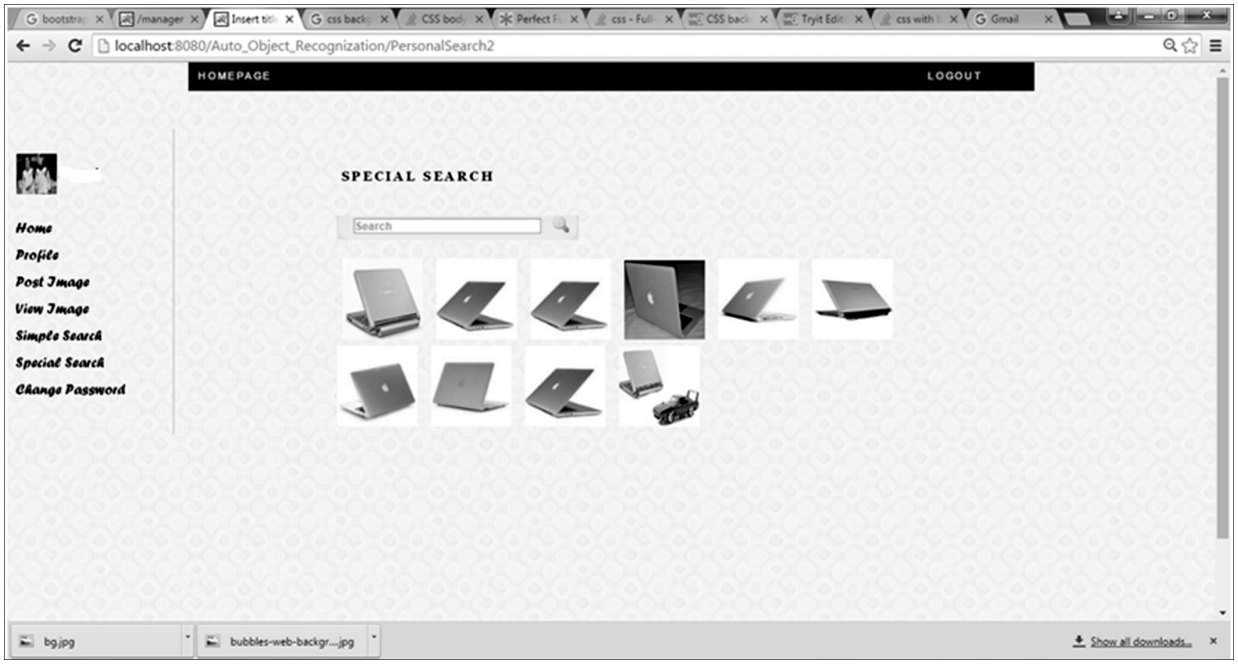

Figure 3: Output Images of Proposed System

A. Offline Process Algorithms

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

Online Processing Algorithm

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.

5. EXPERIMENTAL RESULT

An experiment has been conducted through Open Computer Vision with Automated Concealed Annotation algorithm, as display ranked images based on the Automated hidden tagged and Hash coded images are shown in Figure 2 and 3. An experimental study has been carried out a leading university in Chennai for a period of 4 years from Dec 2012 to Dec 2016. The performance of proposed approach can be evaluated by comparing with the normal tag search versus automated hidden tag search algorithms. Our proposed scheme is tested using Automated Hidden Tag search image retrieval from the web and this method is implemented while the user uploading the images through the Offline process. The Figure 2 and 3 shows the retrieved images of proposed method as a special search. Table 1 shows the performance and experimental result analysis of uploaded total images with different categories with automated hidden tag method is implemented with these images while uploading in the offline.

Table 1
Comparison of Proposed and Existing method

Image Category	*Total Images (N = 150)*	*Results from Proposed Method*	*Results from Normal Tag Method*
Ball	20	18	5
Bat	20	18	5
Laptop	20	17	10
Helicopter	20	18	15
T-Shirt	25	24	12
Pant	25	24	12
Car	20	19	12
Total	150	138	71

The results are validated by calculating the deviation of the results obtained through the proposed method and the real results obtained from the web image information retrieval system. The calculations are shown in the Table 2.

Automated hidden tagging method takes the image as the helicopter, Laptop, Bat and Ball it compared with pre-stored object features, so it produces better accuracy than the Normal tag search process, which is the accuracy in an automated hidden tag-based image information retrieval is 43 – 85%.

Table 2
Differences between the results Expected vs. Obtained

N = 150	*Results from Proposed Method*	*Results from Normal Tag Method*	*Obtained Difference*
Mean	0.92	0.47	0.45
Variance	125.27	33.16	92.11
Std Dev	11.19	5.76	5.43
Std Error	0.91	0.47	0.44

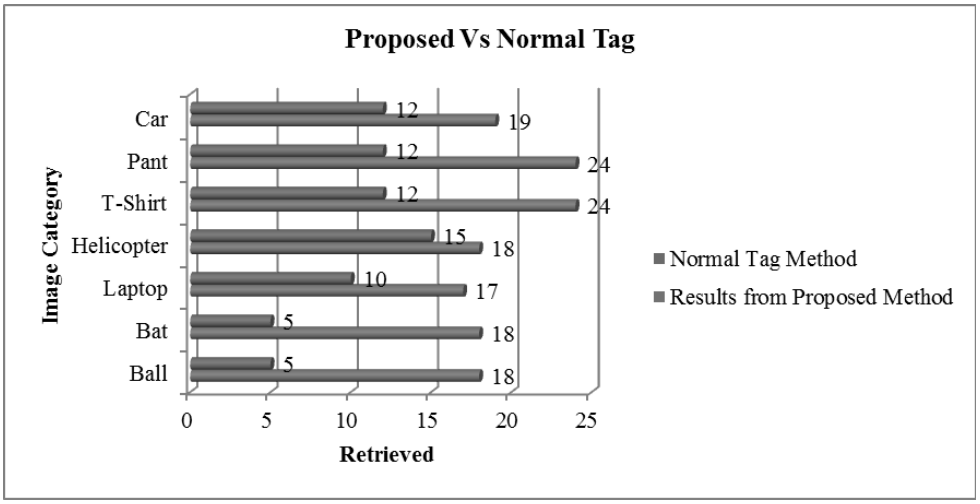

Figure 4: Results Obtained by Proposed Method vs. Existing Method

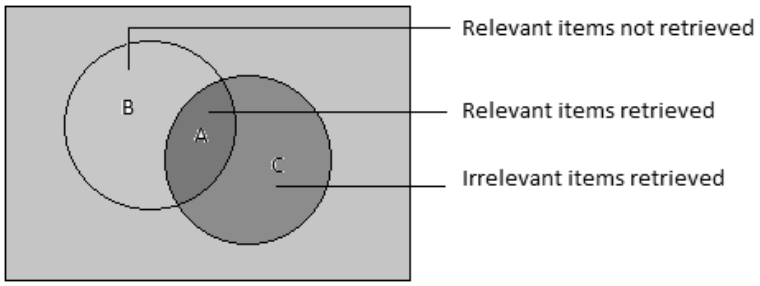

Figure 5: Evaluation: Building blocks

Table 1 and Figure 4 Shows the Results Obtained by Proposed Method vs. Existing Method. According to the experimental analysis, the proposed system has a better performance rather than the existing system. The standard deviation and standard error clearly show that the proposed method yield nearly good results.

6. PERFORMANCE EVALUATION

The precision and recall are the two fundamental measures of search effectiveness. We discuss their building blocks (A, B and C) give a probabilistic interpretation and provide an initiative explanation of what they reflect. The building blocks evaluation determines the performance of the proposed method is shown in Figure 5.

The developed method, a database contains 150 items on a particular topic and search were conducted on that topic and 138 items were retrieved, of that 138 items retrieved, 129 were relevant. According to this data

items, Let A = 129, B = (150 – 129) = 21 and C = (138 – 129) = 9. The Recall and Precision can be calculated by using the following equations,

$$\text{Recall} = [A/(A + B)] \times 100\% \quad (1)$$

$$\text{Precision} = [A/(A + C)] \times 100\% \quad (2)$$

By applying the above formulae to the developed system, the Recall and Precision are 86 % and 93% respectively. The F- Measuring Search Effectiveness; [15] evaluates the performance of the proposed method; this performance evaluation is measured by using the values of Recall (equation 1) and Precision (equation 2) measurement.

$$F = 2 \times PR/(P + R) \quad (3)$$

By applying the above formulae to the developed system, search effectiveness of F- measures and the accuracy get 89% and 92% respectively.

7. CONCLUSION

This research is concerned with an Implementation of Web image information retrieval through the proficient portal with ACA algorithm. The proposed system offers many advantages including better accuracy, good speed and security. 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 tagging process with visual feature extraction and comparison is the main technique used in this system. This system assurances quality image retrieval in short time.

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