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Abstract
Query and Image based recommendation sorted by the method of re-ranking provides an accurate output of images based on the visual semantic signatures of the query image. In query based recommendation, keyword expansions help provide better results whereas in image recommendation, re-ranking based on priority of images accessed by other users provides more accurate results. This paper presents an Android application with basic features comprising of an image recommender system which provides a text as well as image based output on the type of query provided by the user. The input can also be text based or image based. The results obtained are re-ranked and prioritized according to user intention and also differ with respect to different users. The information of users search interests are stored offline and a profile based system is maintained for each and every user so that accurate results are obtained for different users working on the same device.

Index Terms — Smartphone image recommender, image recommender, profile base image recommender, image re-ranking.

I. INTRODUCTION
The primary objective of this paper is to provide accurate search results based on keyword expansion as well as comparing the semantic signatures of images to provide re-ranked images for the android operating system. Such a system is not yet available in Smartphone devices especially android but it exists for the Apple OS commonly known as IOS. The application will feature a search box for typing queries as well as have an option to browse and open the image which the user requires to search for in the web. There are two stages: offline stage and online stage. Semantic signatures of any image queried by the user is calculated and stored in database at the offline stage. Most of the work is done at the offline stage. At the online stage, the user receives re-ranked images those are calculated using semantic signatures at the offline stage.

If the keyword is LOTUS CAR or any kind of LOTUS TEMPLE used, the results are much less diverse than images which are retrieved by original keyword “LOTUS. In classifier of reference Class, visual feature of different type are classified here. Any image having multiple query keywords is stored in database and each word or image file having different relevant keywords are stored offline and its semantic signatures are extracted by calculating similarity between image and previous reference class. Depending upon number of relevant keywords, relative semantic signatures are generated all of which are stored offline.

At the offline stage when the user enters the query keyword, the set of all the most relevant query keywords (for example if user enters query LOTUS” its relevant query keywords such as “LOTUS TEMPLE”, “LOTUS CAR”, “LOTUS DRAWING “are all suggested) are referred to the user shown in figure 1.
Our approach is to provide only accurate relevant information or image to the user instead of creating a huge concept dictionary. We can calculate visual semantic signatures of different query keywords individually and narrow down query keywords referred to the user. Suppose the user enters the query “sunset”, then the semantic concept of “houses” and “temples” are unnecessary or irrelevant and can be discarded and other semantic concept like “Greenery” and “River” can be included in the reference class. So the least related images are re-ranked and discarded. The performance of re-ranking in terms of both efficiency and computational cost which are increased by the most related images automatically. (While comparing semantic signature of query image and reference class images).

Thus the semantic signatures are narrowed down and it contains only the required signatures which results in less number of comparisons required which reduce the required time. Because of large variation of information in web and large number of keywords it is difficult to handle manually so we are introducing the concept of keyword expansion. We also provide database which contains words and images indexed accordingly where for every 120 query keywords there are at least 1,20,000 images which is much less than traditional approach so it improves the performance of re-ranking of the images.

In this paper, section II describes the literature review, Section III provides the related work, Section IV provides the proposed work and Section V contains the conclusion.

II. LITERATURE REVIEW

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III. EXISTING WORK

Existing way of image re-ranking is query expansion using adaptive weight schemes. Adaptive weight algorithm tries to find images related to given selected query image after text-based search result of query image. But this technique does not give proper result as there is no proper indexing and also a visual feature does not correlate images very well. Re-ranking without query expansions provides large number of word-image indexing which in turn gives unnecessary images which are not required. Suppose if the query image is “LOTUS” so it will give all the related images such as LOTUS CAR, LOTUS TEMPLE, LOTUS FLOWERS and LOTUS DRAWING so it does not cut off the images which are not required.

Moreover Google or any other search engine provides an option to search only images by providing an image based input as well as query but this feature is available only for Windows OS and MAC OS. They basically provide two options, either we can paste URL image or we can directly drag and drop that image into the search box. However in android we can search image or any data using voice commands but it does not provide proper output to user in terms of images. Also this technique used for re-ranking is outdated.

- **Adaptive weighting scheme**

The user provides a query image and all the images related to query image is obtained. This can be done by taking into consideration the visual features of query image with all related images having same visual features. It is similar but unnecessary or irrelevant images are also re-ranked. Thus it does not fulfill the user requirement.

**Example:** In most of the search engines like Google when a pool of images are retrieved by the search engine on the basis of textual information when a query is entered. The user can select one query image and then all related images are re-ranked by considering visual similarity of query “image”. If suppose the query image is “sunset” then images not related to sunset such as Eiffel tower or lighthouse are obtained which is unnecessary and not required by the user which proves that the quality of the image based results are not accurate and hence are not efficiently re-ranked. In the following figure 2 shows, the query image of sunset is provided and from that some unnecessary features are extracted like that of a lighthouse etc. The features extracted are first converted to binary code and then the binary code is converted to compact code and that given image.
Matched with the images present in the database and then accordingly images are re-ranked and finally a re-ranked list is created. The search engine pre-computes offline and stores visual features of images. The computational course depends on the matching of the images with that of images present on the database. High efficiency can be obtained when the visual feature vectors are short.

But the major difficulty is that visual feature does not well correlated with images which have similar semantic signatures and so a wrong interpretation of users search intension occurs. So this problem must be overcome so that only relevant images should be provided to the user. According to our study, image is retrieved by 120 query keywords alone includes more than 1700 concepts. Therefore, it is very difficult and inefficient to design a huge concept dictionary to characterize highly diverse web images.

IV. PROPOSED WORK

Now our concept is to provide proper indexing and image are re-ranked on bases of user requirement or need, for this image is re-ranked using keyword expansion to provide better efficiency. We use semantic signature to get more precise output. So, re-ranking can be easy. We develop this application for android.

A. Re-ranking precisions

The primary aim is to develop this method in android platform. Using QSVSS multiple the images are re-ranked accurately and the problem of image re-ranking is solved. In our proposed system a user has to upload image directly which is available in gallery of Smartphone and based on those images, suggested images after re-ranking as well as information will be provided on that specific image. Following figure 3 shows how images are re-ranked. Here semantic feature of green apple is much similar to that of an apple tree in term of color and in terms of shape it is much similar to red apple. That's why graph shows high output at that point.

![Figure 3. Re-ranking of lotus framework](image)

There are two different new approaches for computing semantic signatures as:

1. **Query specific visual semantic space using single signature (QSVSS_Single)**

For an image, a single semantic signature is computed from one SVM (Support vector machine) classifier trained by combining all types of visual features.

2. **Query specific visual semantic space using multiple signatures (QSVSS_Multiple)**
For an image multiple semantic signatures are computed for multiple SVM (Support vector machine) classifiers each of which is trained on types of visual feature separately.

Let's see how to implement this technique or method as shown in the following figure 4. Most of the work is done at offline stage. At the online stage only images are re-ranked on the basis of semantic signature.

At the offline stage when we enter the query keyword, the set of all the most relevant query keyword expansion (i.e. for example if we enter query lotus its relevant query keyword are Lotus flower, Lotus temple, Lotus car and lotus drawing) are selected. This all included in reference class. If keyword is red lotus are much less diverse than those image retrieved by original keyword. If we have a reference class which include both lotus temple and lotus car have similar characteristic (i.e. semantic feature) are removed to improve efficiency at online stage. In classifier of reference class, visual feature of different type are classified here.

- **Keyword associated with images:**

  Any image may be having multiple query keywords. It is stored in database and each word image file may have different relevant keywords. For each image its semantic feature are extracted by calculating similarity between image and previous reference class. Depend upon number of relevant keyword relative semantic signature are generated all these are stored offline.

  In online stage here we search any image and according to that image are re rank by comparing similarities of the semantic signature or database that is stored offline.

![Figure 4. Diagram of our new image re-ranking framework](image)

**B. Profile base re-ranking**

When user have log in for searching images according to their use After the user log in, initially user log displays the information about the previous user recently searched images. From that a particular query selected by the user or a new query given by the user which retrieves images from the database. In the existing system, classification of images can be displayed by means of semantic signature. In our
approach visual and textual features can be compared with the user selected image by means of shape, color and texture. In the annotation bag process K-means algorithm can be used to split the positive and negative bags which contain relevant and irrelevant images respectively. In a query keyword a pool of images are re-ranked by the search engines based on the query. By asking the user to select a particular image from the pool, the remaining images are re-ranked based on the user selected image.

**User log for user log in** - An effective exploitation of user logs for improving the performance of images retrieval system is reduced the no. of user interaction required before satisfactory result are achieved. The system assume the availability of user log from previous user interaction for a given query concept. Thus the system is to exploit the existing user log to improve the performance of the image retrieval system.

V. **CONCLUSION**

We propose Smartphone image recommender system which is good for image search for the smartphone. Both text and images will be provided to this Smartphone image recommender and then the recommendation of image will carried out. To provide proper indexing and image are re-ranked on bases on user requirement or need the image are re-ranked using keyword expansion to provide better efficiency and effectiveness by using precise output so we propose all this technique in web as well as in android platform for Smartphone.

VI. **REFERENCES**


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