

Contribution of GPS-Enabled Applications for Customized Tag Suggestion

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Abstract--Social markers like tags become significantly important to catalogue and explore massive repositories of community contributed images on public domains. To spawn high-quality social tags, tag suggestion by automatically assigning suitable tags to images draws attention to particular research. In this paper, we target on achieving customized tag suggestion and try to spot user-inclined and geo-location-specific tags for an image on the public domain. For users and geo-locations, different users have different perspectives, hence we introduce a subspace learning method to divulge in both the types of perspectives a user may have. The goal is to incorporate the visual and textual contents, of an image, into a unified subspace. Furtherwe create an intermediate subspace, where the digital images are transformed into tags. For a given untagged image, system uses nearest neighbour search and past tag searches to obtain distinct user-inclined and geo-location-specific tags. Finally, the tags related to the geo-location and user profile information are suggested to the user automatically. Experiments collected, on a large-scale data set, from Flickr prove the effectiveness of the proposed solution.

Keywords--geo-location; suggestion; subspacelearning; user-inclined; tagging past

I. INTRODUCTION

Due to the gain in popularity of GPS-enabled devices, we have witnessed an inherent growth of images on public domains. Multiple photo sharing websites like Flickr, Corbis, Picasa and Zoomed provide access to large number of users to upload and share their personal photos through their smart phones or other internet-accessible devices. A tag is a non-hierarchical term assigned to a data. Social tagging is the process that assigns words that are relevant for the image. Tagging allows user to find object when retrieving that object later. It also increases the accessibility of media object to the public as other users can find their relevant images.

Tag suggestion inspires users to add more tags while bridging the gap between human perception and the features of media entity. Many tag suggestion strategies have worked upon this. Users like to create photo album with respect to the places they have visited. This task can be achieved by adding geo tags for photos.

Fig.1(a)



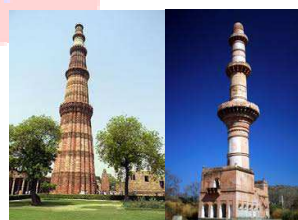
User 1

User 2

Tag: Arched architecture

Tag: India gate, tree

Fig.1(b)



Tag: Qutab Minar
Tower

Tag: Chand Minar
Tower

Geo-location:
Delhi

Geo-location:
Maharashtra

Among these applications, assigning proper tags to photos is the pivotal task. Obviously, manual tagging is very time-consuming and impractical due to the massive photos and the limited screen size of the mobile devices. To make it easier, tag suggestion methods are proposed to recommend some relevant tags to a given photo and allow users to select their preferred tags, which can not only ease the burden for users to upload and share their photos on social website, but also allow them to

devices. User have personal preferences for photos, which can be observed by the following two aspects. First, users favour different types of photos. as shown in Fig. 1(a). Geo-location refers to the city in which each photo was taken. It can be derive according to its longitude and latitude by Flickr API. It can provide more appropriate suggestions by taking user's profile into account. On the other hand ,users spend considerable effort to organize their photo albums geographically by describing photos with tags related to locations where they were taken. Hence, the geographical information of photos should be explored in tag suggestion. Besides, some location specific tags are helpful to distinguish some visually similar images. As shown in Fig. 1(b), the two visually similar photos are possibly assigned to the same tags without considering the geographic information even if they are taken by the same user. Therefore, investigating the geo-location preference towards tags from this huge amount of context multimedia data can provide us useful information to recommend the most relevant tags to a given photo.

The rest of this paper is structured as follows. In the next section, we review the related work about tag recommendation. The existing system is revisited in Section III. The proposed methodology for learning user and geo-location inclination towards tags is elaborated in Section IV. Finally, conclusions with future work are drawn in Section V and VI.

II. LITERATURE SURVEY

Generic Tag Recommendation. Generic Tag Recommendation models: Tag recommendation methods [1], [9], [10], [2], [11] are to predict the same list of tags for the same photo, i.e., it doesn't consider the user preference. Shen et al.[1] proposed a multitask structured SVM algorithm to leverage both the inter-object correlations and the loosely-tagged images. Images are annotated completely based on image visual content [12]. For an image, it first finds its top-k neighbouring images from the community images set and then selects the most frequent tags in the neighbour set as the annotated results. In [2], two approaches, based on Poisson Mixture models and Gaussian process respectively, are proposed to make effective and efficient tag recommendations. In [3],

tag concepts derived based on tag co-occurrence pairs are indexed as textual documents. The candidate tags associated with the matching concepts, which are retrieved with the query of user-given tags of an image, are recommended.

Tag Recommendation Using Geo-tags: Tag recommendation based geo-specific [5], [6], [7]. A typical approach as introduced by Moxley et al. [7] proposes Geo context is fused with visual concept detection in a concept-dependent manner to improve visual search. The above methods completely ignore the user factors and suggest same tags to visually similar photos of different users. So, we propose a learning algorithm to effectively uncover user preference from user's tagging history.

Personalized Tag Recommendation. Personalized Tag Recommendation: Tag recommendation has attracted significant attention recently. Tag recommendation is obtained using both a Naive Bayes classifier on user tagging history and TF-IDF based global information [13]. In [4], tag co-occurrence for photos is calculated using tags appearing both in the tagging history of a user and in Flickr website, and used to generate recommended tags. A simple personalized image annotation method is designed in [14], which simply annotates untagged images with the most frequent tags in the user tagging history. **Tensor decomposition models:** Tag recommendation by exploiting Tensor decomposition models [15], [16], [17], [18], [19]. Rendle et al. [17] propose a special case of the tucker decomposition model, pairwise interaction model, to predict the tag sets. In [18] Music Box tags based on social tags by capturing the three-way correlations between users-tags-music items using three-order tensors. The low order tensor decomposition is proposed in [19], which include 0-th, 1-st, 2-nd order polynomial to reconstruct the data. The above methods only focus on photos, users and tags but completely ignore the geographical information of photos. Other personalized tag recommendation methods which uses candidate tags by exploiting geo-tags [8]. In our paper, we propose a subspace learning approach to individually uncover user desired tags by exploiting user's tagging history and geo-position specific by using the geographic information of photos and then unify the learned subspaces assisted with the search scheme to recommend user preferred tags to a photo.

III. EXISTING SYSTEM

Social tagging becomes increasingly important to organize and search large-scale community-contributed photos on social websites. Whereas, the existing system adopts manual tagging. It performs the search on the entire database rather than collecting a group of data or history based on it. Manual tag assignment is very time-consuming and impractical due to the massive photos and the limited screen size of the mobile devices. To make it easier, tag suggestion methods are proposed to suggest some relevant tags to a given photo and allow users to select their preferred tags, which cannot only ease the burden for users to upload and share their photos on social website, but also allow them to tag and organize their personal images on mobile devices. It is a prolonged and challenging job. Most work attempts to learn the association between tags and photos, while the user preferences are ignored in the recommendation. Users have personal preferences for photos, which can be observed by the following two aspects. The geographical information of photos should be explored in tag recommendation. Besides, some location specific tags (e.g., Taj Mahal and White house) and location related tags (e.g., Agra and Washington) are helpful to distinguish some visually similar images.

IV. PROPOSED SYSTEM

We propose the idea of customized tag suggestion by acknowledging the tagging process and the geographical data in social websites. We are seeking a subspace learning method to separately introduce user preference from his/her pursuing history and locate geographical preference to the tag. Throughout the subspace learning method, the tagged images related to the user are preferred, so we place different ways to interconnect the visual and textual domains i.e., a unified subspace which is being used by both domains, where parallelism is made between visual features and textual representations of photos. Considering the visual feature is a much lower level representation on semantics than the textual information, we first map the visual features into an intermediate space, which is required to be structurally consistent with the textual space. Our system operates optimally on

a web hosting server that is Flickr, Picasa etc. We practise three modules in our paper and they are geo-location, image search and customized tag suggestion.

A. Geo-location

This module is used for arranging images on the basis of geographical region by justifying images with the tags that are relevant to its location. These images were taken as per the geographical data of the photos which investigate the tag suggestion. We seek a subspace learning method to subjectively enhance user preference by introducing user's tagging past and geo-location inclination by enhancing the information of images.

B. Image Search

This module is where we use images for tag suggestion. An untagged photo including geo-location is provided, by the user. In the unified spaces, we will get respective user and geo-location inclined tags which are obtained by the nearest neighbour search. Now, the obtained tags and visual behaviour of the photos are merged to observe the visually related photos, among which the suggested tags are the most widely used.

C. Customized Tag Suggestion

Recently, customized tag suggestion has gained significant popularity. Here, we use an algorithm called the Naive Bayes Classifier algorithm for obtaining the tag recommendation on the user's pursuing history, along with this we also make use of TF-IDF based global information. Tag co-occurrence for photos is calculated using tags appearing both in the tagging history of a user and in Flickr, and used to generate submitted tags.

V. CONCLUSION

We suggest to mine the personalized tag for newly updated photos using user profile based information such as their past tagging searches and geographic location information, like the latitude and longitude values. We also propose a new subspace learning algorithm to independently find the user and geo-location inclination regarding tags. In this method, the text features and visual features of photos are mapped into a unified space using three transformation matrix. One matrix is used for text features and remaining two matrices are used for visual features, to find the appropriate tags of an untagged image. We first map the untagged image

into the unified spaces in terms of the user and geographic information to find relevant tags and then perform semantic and visual photo retrieval to find relevant photos. Finally, the most frequent tags in the relevant photos are suggested to users. Extensive experiments have been conducted to validate the effectiveness of our personalized tag recommendation method.

VI. FUTURE WORK

Future usage of this concept can be development of some social applications. Also, customized product suggestion, geo-location based traveling suggestion and personalized geo-specific news report. It can be even used in potential research topic on how to investigate the joint or partially joint connections among user, geo-location, social tags and photos to enhance the latent subspace learning performance.

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