

# Social Tag Recommendation Based On Geo-Location

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**Abstract--**Due to the rapid popularization of GPS-enabled camera devices and mobiles phones, recent years have witnessed an explosive growth of personal photos. Day by day social tagging is increasing to organize and search large-scale society contributed photos on websites. Hence to promote high quality social tags, tag submission by spontaneously assigning related tags to photos draws attention to the research interest. In this paper, we concentrate on the customized tag submission and attempt to recognize user-desired, geo-position specific photos. In here, we use a subspace learning method to uniquely uncover both types of priorities. The aim of our work is to learn a unified subspace divided by the visual and textual domains to make both of them contrast. Thinking about the visual feature which is an inferior level of representation on semantics than the textual facts. We take on a learning idea by additionally presenting an intermediate subspace for the visual domain, and anticipated it to have a coherent local structure with the textual space. Then we amalgamate the obtained tags and the visual appearance of the photo to find out semantically and visually connected photos, in the midst of the most common tags that are used as the advocate tags. Tests on large-scale data set collected from Flickr confirm the things of the intended systems.

**Keywords-**User desired; subspace learning; customized tag submission; geo-position specific

## I. INTRODUCTION

Considering the rapid growth of people using GPS-enabled camera devices and mobile phones, which have led to a huge growth of personal photos with gross context like tags, geo-location and visual attributes. Further, there are many more photos-sharing websites, such as Flickr, Corbis and Picasa which facilitates many users to upload and share their personal multimedia data by their smart phones or other internet accessible devices. Since, community-contributed photos have increased drastically on personal devices or on the social websites. We face many challenges based on multimedia, such as retrieval, annotation and recommendation. Among those applications, assigning proper tag to photos is the crucial task. Manual tagging doesn't come in picture due to massive photos and limited screen size of the mobile devices. We propose methods for tag submission that suggest some relevant tags to a given

photo and allow users to select the desired tags. This will ease the user burden and helps them to organize their personal image on mobile devices. We emphasize on user's personal preference. For instance, some prefer lake side architecture, while other are in favor of the evening light architecture as show in the Fig. 1(a).

Fig. 1(a)



User1

User2

**Tag:** Lakeside **Tag:** Evening lightarchitecture.  
architecture.

**Fig. 1(b)**



**Tag:**Tokyo skyfree tower**Tag:**CN tower

**Geo-loaction:**  
Japan Canada

**Geo-location:**

Users spend their quality time to organize their photo albums geographically by relating tags to location where they have been taken. Therefore, geographical information of photos should be explored in tag submission. As shown in Fig.1(b), two similar visual photos are possibly assigned to the same tag without considering the geographic information even when it is taken by the same user. We propose to recommend tags to any untagged photos by the nearest neighbor search.

An intermediate space between the visual space and the learned unified space is introduced to compare the textual space with semantic structure, and this will lighten the semantic gap between the visual and textual domains. The intermediate space and the unified space are formulated into a unified form, and an iterative optimizing solution and is convergence proof are provided.

The further structure of this paper is as follows. In coming section, we review the related work about tag recommendation. In section III we discuss about the existing system. Section IV gives the proposed model for learning user preference and geo-location tag submission. Finally, conclusion with future work are enclosed 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 neighboring images from the community images set and then selects the most frequent tags in the neighbor 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 an 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 this paper, new photos are tagged using user's own vocabularies by accumulating votes from the candidate images, which are selected in term of

three preferences: visual features, geographical coordinates and image taken time.

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

As we know, due to rapid growth in GPS-enabled devices, there is a rich growth of personal photos with context like tags, geo-location and visual attributes. There are many photo-sharing websites such as Flickr, Corbis and Picasa, where many users share their personal multimedia data. However, this consequence has led to drastically increase the community-contributed photos whether it's on personal devices or on the social website. We face many challenges due to the overwhelming amount of context data for multimedia applications, such as retrieval, annotation and recommendation. In existing system, tags are assigned manually which is time consuming as well as impractical. Since, there are massive photos and the limited screen size of the mobile devices. To make it easier, tag submission methods are proposed to suggest some relevant tags to a given photo and allow users to select the desired tags, which reduces the burden for user as well as upload and share their photos and help them to tag and organize their personal images on mobile devices. The existing system recommends manual tagging which is time consuming and it ignores user preference. Users have personal preference for photos, which can be observed in the fig1. Users are used to spend their effective time to organize their photo albums geographically by describing photos with tags related to location. Therefore, geographical information of photos should have been explored in tag recommendation.

### IV. PROPOSED SYSTEM

We propose a system that jointly explore the user preference and the geographic preference towards tags for tag submission. We learn a unified space shared by the visual and textual domains, in which we can tag an untagged photo by the nearest neighbor search. An intermediate space between the visual space and the learned unified space with semantic structure, and this can alleviate the semantic gap between the visual and textual domains to some

extent. The learning problem for the intermediate space are formulated into a unified form, and an iterative optimizing solution and its convergence proof are also provided. Our system operates optimally on a web hosting server that is Flickr, Picasa etc. We use three models in our system and they are geo-position, image search and customized tag submission.

#### A. Geo-position

We propose a subspace leaning approach to individually uncover user desired by exploiting user's tagging history and geo-position preference by exploiting the geographic information of photos, and then jointly explore the learned subspaces assisted with the search scheme to submit user desired tags to a photo.

#### B. Image search

Given an untagged photo with its geo-position to a user, the user-desired and the geo-position-specific tags are found by the nearest neighbor search in the corresponding unified spaces. Then we combine the obtained tags and the visual appearance of the photo to discover the semantically and visually related photos, among which the most frequent tags are used as the submitted tags.

#### C. Customized tag submission

Customized tag submission has attracted significant attention recently. Tag submission is obtained using both a Naive Bayes classifier on user tagging history and 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

In this project, we propose the customized tags for new refurbished photos using user's tagging histories and geographic details. In the proposed method, the visual features and text featured of photos are mapped into a unified space by three transformation matrices: two for visual features and one for text features. To bridge the semantic gap, we propose to first map visual features into an intermediate space having the consistent semantic with the text space. For an untagged photo, we first map it into the unified spaces in terms of the user and geographical 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 customized tag submission method.

## VI. FUTURE ENHANCEMENT

Future usage of this concept can be development of some social application. Also, Personalized product recommendation, geo-location based travelling suggestion and personalized geo-specific news report. It can be even used in potential research topic like 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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