Survey of Social Tagging with Assistance of Geo-tags and Personalization

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Abstract - Social websites such as Flickr, zoomer, Picasa are photo sharing websites that permit users to share their multimedia data over the social networks. Flickr inspires sharing photos with tags, joining in interested groups, contacting other users with similar interest as friends as well as expressing their preference on photos by tagging, commenting, sharing, annotating. The user's social tagging includes metadata in the form of keywords reflects users preference over those photos and those can be better utilized to mine the users preference. The social tags are used in various ways by many of the recommender systems to predict searchers preference on returned photos for personalized search. Geotagging of a photo is the process in which a photo is marked with the geographical identification of the place it was taken. Geotagging can help users to find a wide variety of location-specific information. In personalized tag recommendation, tags that are relevant to the user's query are retrieved based upon the user's interest.

Keywords –Personalization, Geo tags, Co-occurrence pairs, Subspace learning,

INTRODUCTION

Social tagging is the process that assigns the important words that are relevant for the multimedia data. Humans can assign tags for photo but it requires a time. Tag recommendation inspires users to add more tags while connecting the semantic break between human perception and the features of media entity, which offers an achievable solution for Content Based Image Retrieval (CBIR). Many tag recommendation strategies have worked upon connection between tags and photos. Users like to create photo album with respect to the places they have visited.This task can be achievedby adding geo tags for photos. Geo tagging is the process of including information to various media objects in the form of metadata such as longitude, latitude, city name etc. Same tags can be recommended to visually similar photos of user but if geo favor of user is considered then it will recommend photos that are relevant with location. Social tagging describes the multimedia data by its meaning from its metadata and syntax of that multimedia data such as features patterns. In traditional systems tagging can be done by two ways,

Quality of tagging is reduced with the human based tag assignment. As per the M.wang, B. Ni et.al [1] proposed three techniques for tagging that improve manual tagging and automatic tagging:
1) Tagging with data selection and organization: manual process for tag selection from data
2) Tag recommendation
3) Tag processing: - It is process of refining tags or adding new tags.

Half percentage of the tags offered by Flickr users are truly interrelated to the photos. Second, it hasdeficiency of an optimum ranking strategy. Let's take Flickr as example. There are dual ranking preferences for tag-based social image exploration,time based ranking and interestingness based ranking. The time-based ranking method ranks images based on the uploading time of each image, and the interestingness-based ranking method ranks images based on each image's interestingness in Flickr. Above two methods do not take the graphical content and tags of images into consideration. It gives irrelevant results. It gives irrelevant results. Therefore, tag oriented image retrieval is used to provide highly efficient results.

LITERATURE SURVEY

A] Motivation for annotation in mobile and online media
M. Ames et.al [2] proposed in, *"why we tag: motivation for annotation in mobile and online media,"*Flickr is a popular web based photo sharing system It is useful when organization and retrieval of photo's is important task. It allows user to discover other users by sharing photos to other community members or groups. Authors have motivated users to assign tags. Authors described about features that are provided by Flickr such as, Privacy setting. Privacy setting allows user to make available his photo to others either by public or private. Authors explained how the tags, title, comment, and description can be assigned with interface provided by Flickr.

Authors also explained tag-specific retrieval mechanism. Authors have discussed motivations to tag with respect to function and sociality. Table describes motivations for tagging.

Zone tag is camera phone application. It is used to upload photos taken by phone. It can capture, annotate, store and share photos from phone. Tags are suggested based on contexts that are pre-fetched from Zone Tag server. It has feature to provide photo with privacy setting i.e. public or private access. It considers location, time and context while suggesting tags.

Disadvantages: -
1) Organize their memory geographically by reporting photos with tags related to places where those photos were taken.
2) Suggesting non obvious tags that may be confusing to users.
3) Users are inclined to attach a tag even if it is irrelevant.
4) User preference is not considered.

B] Tag Recommendation by Concept Matching

A. Sun et.al [3] proposed in, *"Social Image Tag Recommendation by Concept Matching,"* Tag recommendation is three step process: -

1) Tag relationship graph construction.
2) Concept detection.
3) Actual Tag recommendation.

1) Tag relationship graph construction: -

- First, it selects a set of candidate tags.
- Tag relationship graph is constructed from tag co-occurrence pair.
- Tag co-occurrence pair of tags denotes the numbers of images annotated by that tags.
- Central node is required to create TRG graph.
- Most transpiring tags with central node are included in first iteration of tags tocentral node. Choose those tags that are related with as a minimum of two first iteration tags and areincluded them in the TRG as second iteration tags of central node.

2) Concept detection: -
- Removal central node is key step to detect concept.
- If central node is removed then relation between central node and first iteration hop should be remained as it is.
- It is detected by graph cut problem.

3) Actual Tag recommendation: -

- Compute the recommendation score of each candidate tag with respect to the user-given tags of an image.
- Sorts the candidate tags in descending order of their scores.
- Suggests most occurring tags to the Flickr user.
- Calculating score with Tc and inclusion of cosine similarity leads to matching of tags.

Advantages: -
1) It enables customized matching score computation.
2) It boosts scalability and efficiency of tag recommendation process.

Disadvantages: -
1) Geo specific information is not considered here.

C]Tagrecommendation based on collective knowledge.
B. Sigurbjörnsson et.al [4] proposed in, *"Flickr tag recommendation based on collective knowledge,"* Specified a photo using user defined tags. Ordered list of m-candidate tags established on tag co-occurrence is derived. List of candidate tags are served asinput for tag aggregation as well as ranking. It Produce ranked list of n-recommended tags.
It is two-step process: -

1) Tag co-occurrence.
2) Tag aggregation and promotion

1)Tag co-occurrence: -

- Collective knowledge is generated from user provided tags.
- Two methods are used to calculate co-occurrence between two tags. Symmetric measure And asymmetric measure

2) Tag aggregation and promotion: -
- In tag aggregation lists are merged into unified ranking.
- It has Two methods, 1) Voting. 2) Summing.
- *Vote*: - A list of suggested tags is acquired by sorting contender tags on votes.
- *Sum*: - It takes combination of all tag list and adds over co-occurrence values of tags.

Advantages: -

1) It can handle evolution of vocabulary.
2) It can recommend locations, objects and things.

Disadvantages: -

1) User-provided tags are usually limited, one reason is that it is difficult and often requires high mental focus to figure out a lot of words to describe image or video content in a short moment.
2) It ignores user preferences or not personalized.
3) No evaluation setup for studying user.
4) Being less interactive, performance calculation is not accurate.
5) It requires crucial tuning parameters.
6) System is expensive.

D] Georeferenced tag recommendation.
A. Silva and B. Martins [5] proposed in,*"Tag recommendation for georeferenced photos,"*Georeferenced tag recommendation annotates geo referenced photos with descriptive tags. It discovers redundancyover huge number of annotations accessible at online sources with other geo referenced photos. Previous methods have used heuristic approaches for integrating geospatial contextual information but in this method supervised learning is used to rankmethods for combining different estimators of tag relevance. Various estimators are used such as, adjacent images, different users, number of visits on website made by different users for particular photo, geospatial distance of image and users. Ranking techniques such as RankBoost, AdaRank, Coordinate, CombSUM, CombMNZ

Disadvantages: -

1) It does not consider concept of image to improve to visual search.
2) It ignores user preferences.

E] Personalized tag recommendation.
N.garg and I.Weber et al [6] proposed in, *"Personalized interactive tag recommendation for Flickr,"* a personalized tag recommendation idea that discovers the tagging history by profile of users. System suggests tags dynamically based on Users previous tagging history. User may select from suggested list or simply ignore to tag a photo. It is personalized approach in that learns behavior. E.g. User may tag apple as fruit or apple as electronic device such as laptop, phone, and tab etc. It uses various algorithms such as Naïve Bayes local, Tf-Idf global, and The Better of two worlds.

Advantages: -

1) It is hygienicmethodology that leads to conservative performance.
2) It shows use of old classification algorithms that can be appropriate to this problem,
3) It has initiated a new price measure, which grabs the effort of the whole tagging process,
4) It clearly identifies, when purely local schemes can or cannot be improved by global scheme.
5) It is less computationally complex than collective knowledge.
6) It recommends tags dynamically.

Disadvantages: -

1) It concentrates only on tags of user and not on metadata contextual information and contents.
2) It does not consider geo specific information.
3) It uses group of images, so it does not use classifier.

F] Tensor factorization and tag clustering for item recommendation

D. Rafailidis et al [7] proposed in,*"The TFC model: Tensor factorization andtag clustering for item recommendation in social tagging systems,"*a method that can handle very sparse data. It can utilizeLow order polynomials with help of <user, image, tag, weights>.

Steps of this approach:

1) Tag propagation by exploiting content. It uses relevance feedback mechanism to work on tag propagation between similar items.
2) Tag clustering is performed to find topics on social network and interest of users. It has three types: Tripartite, Adapted K-means, and Innovative *Tf-Idf*
3) TF based HOSVD: - In this cubic complexity of HOSVD is minimized by number of tags to tag clusters. By using this step latent association between user, tag, topics and images are revealed. It requires tensor modeling to dataset and HOSVD to produce reconstructed tensor.

   Steps: -

   - Initial construction of 3 order tensor.
   - Matrix unfolding of tensor A to create three new matrices
   - Apply SVD on each unfold matrix.
   - Construction of core tensor S.
   - Reconstruction of tensor.
   - Generation of Item recommendation.

Advantages: -

1) It handles Learning tag relevance problem, cold start problem, Sparsity problem.
2) It is collaborative-based approach that improves accuracy.
3) It uses relevance feedback mechanism.

Disadvantages: -

1) It ignores geo-specific information.
2) It requires high space and time complexity.

G] Subspace learning with Matrix factorization

J. liu et al [8] proposed in in, *"Personalized Geo-Specific Tag Recommendation for Photos on Social Websites,"* It generates subspace that creates latent space that is output of visual space and textual space. It recommends tags based on this embedded space and it uses content based image retrieval techniques to find and retrieve similar types of images. Those Images are recommended to user. Tag recommendation uses similarity of visual and textual similarities. It recommends tags and photos to users based on his interest, profile history, image features and geo specific interest.

COMPARISON OF ALL METHODS: -

Authors	Title	Work and its type			
		Contents	**Tags**	**User Preference**	**Geo Preference**
Morgan Ames et.al [1]	*Motivation for annotation in mobile and online media.*	Yes	Yes	No	Yes
Aixin Sun et.al [2]	*Tag Recommendation by Concept Matching*	Yes	Yes	No	No

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Sigurbjornsson et.al [3]	*Tag recommendation based on collective knowledge*	No	Yes	No	No
Ana Silva et.al [4]	*Georeferenced tag recommendation.*	Yes	No	No	Yes
N.garg and I.Weber [5]	*Personalized tag recommendation.*	No	Yes	Yes	No
D. Rafailidis et al [7]	*Tensor factorization and tag clustering for item recommendation*	Yes	Yes	Yes	No

CONCLUSION

Survey includes study of social tagging, types of social tagging. It has also covered study of various tagging techniques, their pros and cons over each other and came to conclusion that Subspace learning approach will solve tag recommendation problem with contents, Tags, User preferences and Geo-Preferences.

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