Study of Personalized Travel Sequence Recommendation System

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Abstract- *Tourism is one of the main reasons for the development of the country. It helps in the economical growth of any country. Tourism planning becomes very challenging business. Now a days, various travel recommendation systems helps user to plan trip. For successful trip, it is important to plan destination as well as route for trip. This paper describes Personalized Travel Sequence Recommendation System which recommends the travel route from the knowledge gain from big multi-source social media like travelogues and community contributed photos. It not only mines point of attraction but also the sequence route of the destination*

Keywords- Travel recommendation, geo-tagged photos, Recommendation system, Points of attraction (POI)

I. INTRODUCTION

Tourism becomes an important business in most countries around the world. People travel around the world for different reasons. Travel includes all types of journeys from one place to another. It includes journeys made by people who from one place to another to spend their holidays, to work, reside or study. Some visitors are curious about different cultures or the various points of attractions which may be manmade like museums and monuments or some Natural attractions like mountains, hills or sea beach etc.

Tourism planning becomes very challenging business that plans trips for the tourist. This business can use new technology for trip planning and can attract their clients with very attractive offers. For successful trip, it is important to plan destination and route of the travel. The travel recommendation systems help to plan trip to the travelers to provide a personalized trip.

II. RECOMMENDATION SYSTEM

Recommendation system provides automatic suggestions of items that have specific characteristics similar to the choice of the user. Generally recommender systems are mainly classified into two types: collaborative filtering and content-based filtering.

1. Content-Based systems are based on similarity of items is calculated by measuring the similarity in their properties. The recommendation process matches the attributes of the user profile against the attributes of a content object to find user's level of interest in that object [10].

2. Collaborative filtering system recommends new items by calculating the utility of a certain item for a particular user based on the user's previous likings and the opinions of other like-minded users [9].

In tourism recommendations systems require various attributes like destinations of trip, attractions to be visited, events to participate in, trip route, options to travel, arrangements for stay, etc

III. LITERATURE SURVEY

LOH ET AL, in [1], presented a recommender system that finds cities and attractions for customers by analyzing textual messages exchanged between a travel agent and a customer and discovers points of attractions. The system uses tourism ontology to find themes in the textual messages and acts as a decision support system to the customers. The system only can recommend the cities and attractions for the customer. The text mining method losses the context of words which may change the meaning of a word.

Abdul Majid et. al., in [2], represented user-specific travel preferences from the travelling history of user and recommend the attractions in another city. Author used collaborative filtering for recommendations of location which matches user's history. The problem with location based collaborative filtering is the computational complexity increases dramatically with large amount of users and locations.

In [7], Yong et al.developed a cost-aware latent factor model (cPMF) that focuses on cost preferences and user's interest . The system results into cost-aware tour recommendation. Also they developed GcPMF model that

considers the uncertainty of the travel cost. Also approach is applicable to a broad range of other applications.

In [8], Lui et al developed the TAST model i.e. tourist-area-season topic model. Further they extend it to the tourist-relation-area-season topic (TRAST) model for capturing the latent relationships among the tourists in each travel group [8].

IV. SYSTEM OVERVIEW

According to [3] there are two main challenges for travel recommendation system as follows:

a) The Points of attraction should be according to the user interest
b) System should recommend a sequential travel route instead of individual Point of interest (POI) as it is difficult task of planning route for tour.

It is challenging task to develop personalized as well as sequential travel package recommendation system. The system developed by [3], i.e. a personalized travel sequence recommendation system, can automatically discover travel attributes like interest of user, budget and preferred time and season. System also retrieves the travel sequence which is optimized the top ranked routes by considering social similar users' travel records. Travelogues contain the experiences of author during his/her travel. The community-contributed photographs, are generally tagged with the location either manually through placement on a map or automatically using image metadata provided by a GPS-enabled camera [4]. System

V. SYSTEM ARCHITECTURE

Figure 1. System Architecture

A. Offline module: The offline module mines the topical package space from travelogues and photos shared on Internet. It also mines POIs

B. Online module: Online module mines user package and POI sequence by considering users interest. The online module results into the optimized route from top ranked routes.

C. Topical package space: Topic package space is a kind of space in which the four travel distributions of each topic are described by

1. Representative tags: It describes point of attractions within the same topic.
2. The average consumer expenditure of the POIs within this topic
3. Visiting time
4. Visiting season

First three are mined from travelogues and visiting season is identified from the "date taken" attached with the community-contributed photos. As it is difficult to directly measure the similarity between user and travel sequence, topic package space is used to bridge the gap between user preference and the routes attributes. POIs are mined from the collection of geo-tagged photos.

D. Route package mining: It is related to mining of travel routes. The mining is done offline to avoid wastage of online computing time. the spatio-temporal structure of the POIs is analyzed to construct travel route.

E. User package: User package contains attributes like user interest, cost, visiting time and season. User interest is retrieved by mapping user's tags to the topical package space.

F. Route recommendation: Routes recommendation module ranks the route based on to the similarity between user package and routes packages and then the top ranked route is optimized according to records of similar social users

VI. CONCLUSION

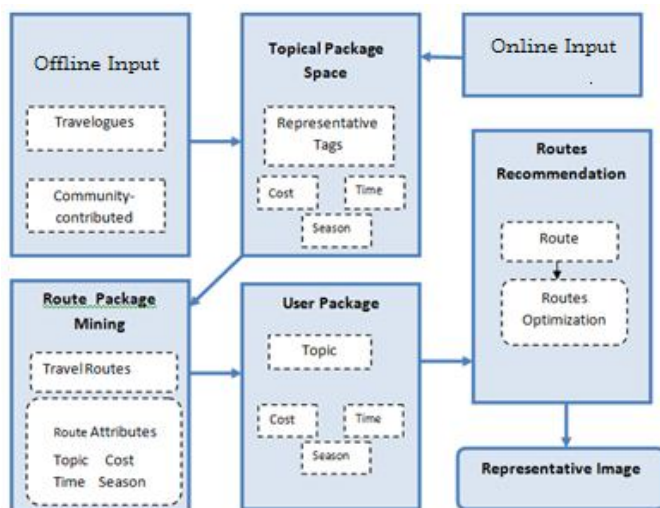For successful trip, it is important to plan destination as well as route for trip. In this paper, a personalized travel sequence recommendation system is studied. The system recommends the travel route from the knowledge gain from big multi-source social media like travelogues and community contributed photos. The system also considers the factors like

cost, visiting time and season which support for decision making. The system automatically recommends the optimized route from the user preferences according to their social similar users.

VII. FUTURE SCOPE

The current system does not consider transportation or stay options which are also important in trip planning. In future, the system can be extended to consider more attributes like transportation information.

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