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A Travel Package Recommendation Using TAST and TRAST Models

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Abstract

Providing better travel services for tourists is one of the important applications in urban computing. The worlds is of commerce, travel, entertainment, and Internet technology are linked, different types of business data is accessible for innovative use and regular analysis. Here it provides a study of utilizing online travel information for the personalized travel package recommendation. Though many recommender systems have been developed for enhancing the quality of travel service, most of them lack a systematic and open framework to dynamically incorporate multiple types of additional context information existing in the tourism domain, such as the travel area, season, and price of the travel packages. First analyze the properties of the old travel packages and develop a tourist-area-season topic (TAST) model. This TAST model represents different travel packages and different topic distributions of tourist, the topic extraction is stated on both the tourists and the natural characteristics of the landscapes. According to the topic model representation, a cocktail approach is generated so that to form lists for personalized travel package recommendation. The TAST model is extended to the tourist-relation-area-season topic (TRAST) model for collecting the relationships among the tourists for all travel groups. Then analyze TAST model, TRAST model, and cocktail recommendation approach on the current travel package data. The TAST model can effectively grabs the individual characteristics of travel data and cocktail approach, so it is more efficient than old recommendation techniques for travel package recommendation by including tourist relationships, TRAST model is used as an effective evaluation for travel group formation.

Keywords: ***Travel package, recommender systems, cocktail, topic modeling, collaborative filtering.***

1. Introduction

Tourism is most favored activity when people have free time. Many tourism facilities are provided by many organizations. The people or the tourist chooses his own travel package according to his personal interest. The travel companies focus on the interest of tourist so that to increase their market value and provide huge packages. So there is needed to make travel package more effective. Recommender systems are a developing area and attraction towards it is growing day by day[1]. Through recommender systems the number of product recommendation are achieved while dealing with customer. In e- commerce the recommender system are having great victory. Recommender systems are categories into

• Content based system- in this item recommendation in analyzed. It retrieves the information and filters it for research. For ex if a tourist goes to hill stations many times then database contains “hill station” as recommendation.

• Collaborative filtering systems- it rely on the similar factors of user and or items. Preferences of different users for same item are recommended by system.

Personalized travel package has many challenges while designing and executing the recommended system. First, the travel data are less and scattered for

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an example recommendation for movie may cost more to travel than its price. Second, usually travel package are location based sothey are said to be spatial or temporal for example the package contains locations which are geographically near. And these packages vary season vise. Third, the old recommendation system depends on rating and the travel data may not contain such rating.

To overcome this challenge the cocktail approach is introduced. It analyzes different characteristics of exiting package. Then develop the tourist area season topic (TAST) model which represents packages. Cocktail approach has some extra factors like season and pricing for recommending personal travel package.

2. Literature Survey

Recommendation system is a huge research topic. The lot of work is done on recommendation system in industry as a developing approach. Interest in recommended systems is high as it represents research in problem rich. It has huge amount of applications that help the user to get a personal recommendation as well services. The example of this application is recommending books, CD and etc. The recommendation system still needs improvements at current situation as to make it effective in areas like financial services to investors, real-time applications and smart shopping cart [1].

Tour recommendation is different from other recommendation as the tourist interest in package is directly affected by its cost. Cost aware recommendation of package is need of the recommender system. The travel logs are collected from different agents of company then analyzed for time and financial cost connected to every travel package. The tourist has different level of affordability for aspect of cost. The recommendation system focuses on such factors to make it more effective [3].

Collaborative filtering is a technique which filters the information using different technique of collaboration for different data sets. The large data sets of applications are involved for collaboration filtering. It is a approach that recommender system are interested in. Neighborhood models are the foundation of the Collaborative filtering. The Collaborative filtering is based on rating of items for different sets [4].

Recommender systems propose items from different choices for user by analyzing earlier interest or behavior. The users behavior has impact from unseen interests of user. To invest on getting information about the interest of user is unfavorable to make good recommendations. The present recommender systems based on collaborative-filtering focuses on user's interaction with the system. The information about inactive user is discarded. The topic model collaborated so that to find out the personalized ranking. The aim to generate the item oriented collaborative filtering model. It deals with different problems that represent in old collaborative filtering scheme like overspecialization and cold start problem.

Recommender system focuses on advising user for interesting objects in personalized way for huge options. Content base recommendation schema recommends the similar items that the user had used those items earlier. The content based recommender matches the attributes users profile so that to get sorted set of interest with the object of attributes. Then recommend the interesting items to the user as per the sets [6].

3. TAST Model

The TAST topic model can be accomplished with the help of Bayesian networks in which similarity between packages and tourists can be measured. A Bayesian network is probabilistic graphical model that represents a set of random variables and their conditional dependencies via a directed acyclic graph (DAG).

3.1 Topic Model Representation

While forming packages many issues are to be focused like

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1. Discover different travel places, the seasons for traveling and number of tourist.
2. Determine different topics based on season and type of tourist.
3. Decide the landscape related to season and travel topic.
4. At last the other factors are include like price, accommodation etc.

When recommending a package to a tourist topic is to be decided, it may be the travel places which is visited by tourist or interested in. These packages depend on seasons and also the number of tourists for the package. These travel packages are based on landscape. Landscapes are originated according to season and topic. Limitations on price depending on tourist also represent a factor of topic.

3.2 Area/Seasons Segmentation

Area represents different geographical location where a tourist can visit. These areas are grouped in to different landscapes. Seasons represent the whole year's atmosphere. The landscape is selected according to the season.

4. Cocktail Recommendation

Package recommendation for personal travel is based on TAST model which is a cocktail approach and it represents the hybrid recommendation [2]. Hybrid recommendation combines different techniques to enhance performance of recommendation. The output of the topic from TAST is used to found out seasonal nearest neighbor for every tourist and ranks are allocated to customer package using collaborative filtering. Candidate list is generated in which new packages are added by means of similar packages that were already generated. Then Collaborate price with package by reordering it with feasible price. Remove the unrated package and finalize lit for package recommendation this approach is stated in figure 1.

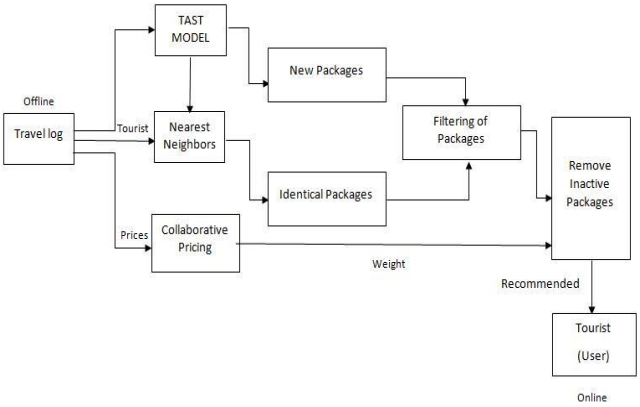
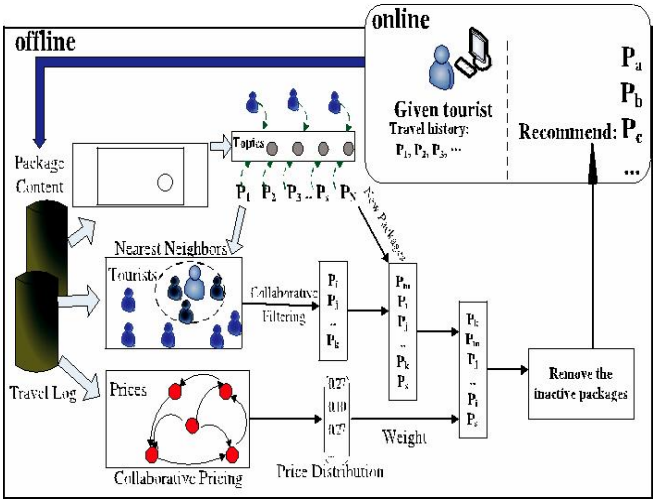
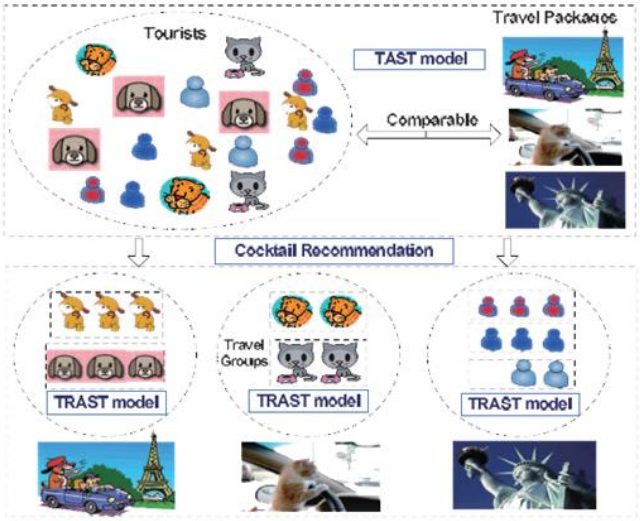


Fig 1 Cocktail recommendation

System Architecture:





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4.1 Seasonal Collaborative Filtering

Collaborative filtering (CF) methods generate tourist specific recommendations for similarities without need for unwanted information. The output of TAST model i.e. the topic and package are considered for finding the similarities between tourist and tourist topic. Through CF the tourist having similar interests similar packages are recommended. The tourists having same inters in specific topic are grouped together. The package recommendation for tourist is little bit complex as the groups are formed so that they enjoy each other's company. Tourist who enjoy the seasons with the other tourist are kept in to similar group are recommendations are set.

4.2 New Package

The problem occurs when a new package is to be recommended to the tourist. Recommended packages are based on the interested in similar package. So here tourist's rates different package as from 1 to 10 and a new recommendation is generated according to rating and its personal or similar package. The new package contains the similar package recommendation as well the probable interest rating from list.

4.3 Collaborative Pricing

Package recommender system has one more factor price. The price of travel packages differ package to package. In Collaborative Pricing the prices of package are divided into different sets then predict the different possible prices according the range of tourists. The packages having prices same or nearly same are recommended. Transition probability among different packages is computed for each price set. For example if a tourist used a package of price A before traveling a package B then edge from A to B will weight +1. The normalized transition probability is generated after summing the all weights of tourists. Inactive packages are removed and final list for recommendation is generated.

From the experimental results, we can see that the proposed cocktail recommendation approach works very well for predicting the tourists' travel preferences by exploiting the unique characteristics of the travel package data.

Key points:

- Tourist-area-season topic.
- Tourist-relation-area-season topic.
- Travel package Tour in amusement parks.
- Travel package for festive season.
- Travel package Adventure parks. etc

5. TRAST Model

The TAST model doesn't focus on travel group information. Number of group formed together for different packages. If two tourists have taken same package but are in different group so it is considered as they have similar interest. Tourists present in same travel package may share similar Things like holiday pattern. A new parameter relationship is added so that gets the connections between tourists. This topic is known as TRAST. It focuses on the relation the tourist maintains with other tourist. The relationship shows the grouping through age or other this the tourist is interested in.

6. Conclusion

There is need to understand the different sets of users interest to provide a suitable package. While recommending the travel package different topics and related information is analyzed. Then develop the TAST model which outputs the topic and season recommendation. It finds the tourist interest for recommending package. It also discovers tourist interest and gives the spatial-temporal correlations for landscapes. The TAST model is utilized to build cocktail approach for personalized recommendation for travel package. The cocktail approach is based on hybrid recommendation strategy. TAST model is extended toTRAST model which acquire the relations between tourists in each group. TRAST model is used for effective analysis of automatic formation.

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