

# A Recommendation Method for Travel Packages using Hybrid Approach

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**Abstract:** The online travel information imposes an increasing challenge for tourists who have to choose from a large number of available travel packages for satisfying their personalized needs. So we have to exploiting effective way of online travel information for personalized travel package recommendation. A critical challenge along this line is to address the unique characteristics of travel data, which distinguish travel packages from traditional items for recommendation. In this paper, we first analyze the characteristics of the existing travel packages and develop a tourist-area-season topic (TAST) model. This TAST model can represent travel packages and tourists by different topic distributions, where the topic extraction is conditioned on both the tourists and the intrinsic features such as locations travel seasons of the landscapes. Then, based on this topic model representation, we propose a cocktail approach to generate the lists for personalized travel package recommendation which follows a hybrid recommendation strategy and has the ability to combine many possible constraints that exist in the real-world scenarios. We extend the TAST model to the tourist-relation-area-season topic (TRAST) model for capturing the latent relationships among the tourists in each travel group.

**Keywords:** Tourist-Relation-Area-Season Topic (TRAST), Collaborative filtering (CF), Latent Dirichlet allocation (LDA), Advance RISC Machine (ARM).

## I. INTRODUCTION

Today the tourist is searching new locations and enjoying the holidays and also check the good travel packages. The tourist of today is very demanding and have multi-layered desires, needs. With the advancement of time and the improvement of living standard, even an ordinary family can do travel very easily on a small budget. In modern trend, more and more travel companies provide online services using social networks. However, the rapid growth of online travel information imposes an increasing challenge for tourists who have to choose from a large number of available travel packages for satisfying their personalized needs and adjustment. Moreover, to increase the profit, the travel companies have to understand the preferences from different tourists and serve more attractive packages for the travelling peoples. Therefore, the demand for intelligent travel services is expected to increase significantly. A critical challenge along this line is to address the unique characteristics of travel data, which differentiate travel packages from traditional items for recommendation. Recommender systems have been successfully applied to enhance the quality of service in a number of fields; it is natural choice to provide travel package recommendations. There are many technical and domain challenges inherent in designing and implementing an effective recommender system for personalized travel package recommendation in first recommender system development. Every travel package consists of many landscapes (places of interest and attractions), and, thus, has intrinsic complex spatio-temporal relationships. Also, different travel packages are usually developed for different travel seasons. Therefore, the landscapes in a travel package usually have spatial

temporal auto correlations. Traditional recommender systems usually rely on user explicit ratings. However, for travel data, the user ratings are usually not conveniently available. Finally, the traditional items for recommendation usually have a long period of stable value, while the values of travel packages can easily depreciate over time and a package usually only lasts for a certain period of time. The travel companies need to actively create new tour packages to replace the old ones based on the interests of the tourists. Recommender systems are now a popular research area and are increasingly used by e-commerce sites. Travel recommender systems are aimed at supporting the critical travel planning decisions that the traveler will face before travel or while on-the-move. Specifically, we first analyze the key characteristics of the existing travel packages, travel time and travel destinations. In this we create some modules such as TAST model, Cocktail approach, TRAST Model and show the result, better influence of the model over the tourism.

## II. RELATED WORK

Recommender systems are commonly defined as applications that e-commerce sites exploit to suggest products and provide consumers with information to facilitate their decision-making processes. In travel packages of the Recommender systems can be classified into two categories:

**A. Content-based filtering:** - Content-based filtering analyses the association between user problems and the descriptions of items. To recommend new items to a user,

the content-based filtering approach matches the new items descriptions to those items known to be of interest to the user.

**B. Collaborative filtering (CF):-** In a collaborative social filtering, these algorithms focus on the behaviour of users on items, which are to be recommended, rather than on the internal nature of the items themselves. In social approach algorithms have a semantic attraction to both the concept of collaborating individuals and the process of find persons with similar interest of travel packages for particular seasons approach does not need content information to make recommendations. Users of social networking services can connect with each other by forming communities for online interaction. There are some algorithm which is used before; is association rule mining (ARM), which discovers associations between sets of communities that are shared across many users and Latent Dirichlet allocation (LDA), which models user-community co-occurrences using latent aspects. In comparing LDA with ARM, we are interested in discovering whether modelling low-rank latent structure is more effective for recommendations than directly mining rules from the observed data.

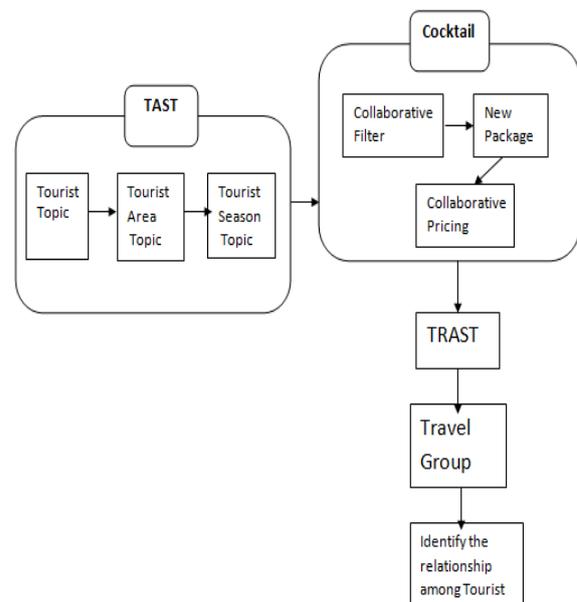
Furthermore the models used in this are TRAST, TAST and Cocktail approach. In the TAST model, the extraction of topics is conditioned on both the tourists and the intrinsic features such as locations travel seasons of the landscapes. The TAST model can well represent the content of the travel packages and the interests of the tourists. Based on this TAST model, a cocktail approach is developed for personalized travel package recommendation by considering some additional factors including the seasonal behaviours of tourists, the prices of travel packages, and the cold start problem of new packages. Finally, the experimental result carried on the real-world travel data, showed that the TAST model can effectively capture the unique characteristics of travel data and the cocktail recommendation approach performs much better than traditional techniques. In TAST model extend the topic models, and explain the corresponding travel package recommendation strategies based on them. By extending the TAST to the tourist-relation-area-season topic (TRAST) model, which helps us to understand the reasons why tourists form a travel group. This goes beyond personalized package recommendations and is helpful for capturing the latent relationships among the tourists in each travel group. These experiments not only demonstrate that the TRAST model can be used as an assessment for travel group automatic formation but also provide more insights into the TAST model and the cocktail recommendation approach.

### III. SYSTEM ARCHITECTURE

In the architecture travel package based on the TAST model, a cocktail approach is a mix recommendation strategy and has the ability to combine many possible constraints that exist in the real-world scenarios. Specifically, firstly we use the output topic distributions of TAST to find the seasonal nearest neighbours for each tourist, and then we use the collaborative filtering to filter

out our required packages. New packages are added into the candidate list by computing similarity with the candidate packages generated previously. Finally, it uses collaborative pricing to predict the possible price distribution of each tourist and reorder the packages. After removing the packages in TAST model are no longer active, final stage of cocktail approach recommendation list. The major computation cost for this approach is the inference of the TAST model.

In cocktail approach diagram is provide offline service to customer and also recommended the good session for the travelling for particular area and tourist packages as shown in fig 1. As the increase of travel records, the computation cost will increase. However, since the topics of each landscape evolves very slowly, in cocktail approach.



**Figure 1: System Architecture**

### IV. PROBLEM DESCRIPTION

#### A. Data collection

A number of data packages are collect in data collection module. New package is created and added with previous travel packages. The number of travel packages generated as per new season. The new tourist is added in to the recommendation system as per newly seasons and different types of tourist expected the new and best travel packages in to fewer amounts paid and selected or generated the new package.

An increasing challenge for tourists who have to choose from a large number of available travel packages for satisfying their personalized needs. Based on the cocktail approach we recommend personalized travel package recommendation. A dataset contain large number of travel packages for recommendation. Travel package includes package id, description, area season etc.

#### B. Models

A Tourist-Area-Season-Topic (TAST) model can represent travel packages and tourists by different topic distribution as per tourist requirement and suitable to tourist. The TAST model can well represent the content of

the travel packages and the interests of the tourists and search best option to the tourist as per suitable to tourist requirements. We use the extension of the TAST model i.e. the Tourist-Relation-Area-Season Topic (TRAST) model for developing the travel group among the tourist. TRAST model is use for searching the relationship among the tourist and even the suggestions given by them. The tourist can suggest the package too and we find out the relation that how many percent the suggestion match to our recommended package. Or else if the suggested package got like by many other users then the package is activated and shown in the offer form. A Tourist-Area-Season-Topic model can represent travel packages and tourists by different topic distribution. The model can well represent the content of the travel packages and the interests of the tourists. Based on the TAST model we propose a cocktail approach which follows recommendation strategy. Cocktail approach is used to generate the lists for personalized travel package recommendation by considering some additional factors including the seasonal behaviour of the tourists. We also extend the TAST model to the Tourist-Relation-Area-Season Topic (TRAST) model for developing the travel group among the tourist. This goes beyond personalized package recommendations and is helpful for capturing the latent relationships among the tourists in each travel group.

**C. Cocktail recommendation approach**

In cocktail approach travel package based on the TAST model, a cocktail approach a hybrid recommendation strategy and has the ability to combine many possible constraints that exist in the real-world scenarios. Specifically, firstly use the output topic distributions of TAST to find the seasonal nearest neighbours for each tourist, and collaborative filtering will be used for ranking the candidate packages. New packages are added into the candidate list by computing similarity with the candidate packages generated previously and even candidate can also add packages with his own taste. Collaborative pricing is use to predict the possible price distribution of each tourist and reorder the packages. Remove the old package which is no longer active and add the package which you want to active, displayed in recommendation list. The major computation cost for this approach is the inference of the TAST model. Through this approach the package creation becomes easy. We mixed the TRAST with this to get relationship with the users. In this the collaborative filtering is done. With the help of collaborative filtering we can filter out the interest of tourist according to his selection and can give him better suggestion. A group is form at the backend with the similar taste of interest. And then any suggestion can be given to the tourist on his suggested package. Admin recommend some packages to user but if the user wants to create his own package then he/she can, after that the admin can gives the confirmation to the package. If the suggested package is also selected by others too (that means they also have the same interest) the package become active and tour will be arrange. Our aim is to create the user friendly site. User interest is very important factor and is considered in this project by taking the

suggestion and through their package creation. Tourist can even find the packages according to landscape, theme, area and his/her budget. Admin part is use for confirmation the suggested package and gives the proper recommendation to the user. Admin has the authority to active the package and deactivate the package. User satisfaction is the main point here. Proposed System Advantage: We can develop the personalized candidate package set for each tourist by the collaborative method. Provides Spatial-Temporal relationship for tourist using cocktail approach. TAST model can effectively capture the unique characteristics of travel data. The TAST model can well represent the content of the travel packages and based on the interests of the tourists. TRAST model is used to identify the relationship among the tourist in each travel group.

**V. DESIGN AND IMPLEMENTATION**

In the design part we create a database design for the experimental purpose of the models. In this create many tables and having many entries in it regarding to our models. User table, package table, theme table etc. Through these entries were trying to recommend the best result to customer.

**a) User Details**

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> username	varchar(100)	latin1_swedish_ci		No	None		
<input type="checkbox"/> gender	varchar(100)	latin1_swedish_ci		No	None		
<input type="checkbox"/> email	varchar(100)	latin1_swedish_ci		No	None		
<input type="checkbox"/> password	varchar(100)	latin1_swedish_ci		No	None		

**Figure 2: User information form**

In figure some fields are mentioned which uses the user information and it accept the propose system. The user information is required for the future suggestion which will be given by user and it also required for security purpose.

**b) Admin Details**

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> username	varchar(10)	latin1_swedish_ci		No	None		
<input type="checkbox"/> password	varchar(10)	latin1_swedish_ci		No	None		

**Figure 3: Admin details form**

In figure, admin details form it authentication of user form. This form is user authenticate for searching best packages of travel as per season. Admin handles all the activities regarding packages and even have authentication too.

**c) Package Details**

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> PackageID	int(100)			No	None		
<input type="checkbox"/> Topic	varchar(1000)	latin1_swedish_ci		No	None		
<input type="checkbox"/> PackageDESC	varchar(1000)	latin1_swedish_ci		No	None		
<input type="checkbox"/> Price	varchar(1000)	latin1_swedish_ci		No	None		
<input type="checkbox"/> Area	varchar(1000)	latin1_swedish_ci		No	None		
<input type="checkbox"/> Season	varchar(1000)	latin1_swedish_ci		No	None		
<input type="checkbox"/> Landscape	varchar(1000)	latin1_swedish_ci		No	None		

**Figure 4: Packages recommendation form**

The package recordation form the user can fill the information as per the requirement and admin is authenticating to that user and new created package suggest to user. The package recommendation form shows the area and season and price of package.

## VI. RESULT AND ANALYSIS

As our contribution we propose a mode which overcomes the difficulties in providing high quality recommendation on sparse data. More information can be used for recommendation by investigating the similar relation among related user profile and its content. We generate the TRAST model and cocktail approach to create packages. With help of model we get the relationship of tourist and also we provide the self tourist can also provide his/her own package creation. By doing this we get know the interest of users and we can create more effective packages as per the user taste. In the result we get know that the user get more choices to choose his package and can select his/her package as per his/her choice. We were giving our recommendation too to suggest some points to user. Through which tourist get know his/her taste better. By using the TRAST model and Cocktail approach recommendation become easy to user and admin too.

## VII. CONCLUSION

We present a personalized travel package recommendation. We first analysed the unique characteristics of travel packages and developed the TAST model, for travel package and tourist representation. The TAST model can discover the interests of the tourists and extract the spatial-temporal correlations among landscapes. Then, we exploited the TAST model for developing a cocktail approach on personalized travel package recommendation. This cocktail approach follows a hybrid recommendation strategy and has the ability to combine several constraints existing in the real-world scenario. Furthermore, we extended the TAST model to the TRAST model, which can capture the relationships among tourists in each travel group. Finally, an empirical study was conducted on real-world travel data. Experimental results demonstrate that the TAST model can capture the unique characteristics of the travel packages, the cocktail approach can lead to better performances of travel package recommendation, and the TRAST model can be used as an effective assessment for travel group automatic formation. You can even add the location factor in addition to help user better understand and remove some mystery.

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## BIOGRAPHIES



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