

Personalized Travel Package Recommendation System: An Overview

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Abstract— Traveling being an area of interest of many people now a days require some good recommender system which can suggest traveling places options based on personal interest of a person. Along with traveling people like to share their location of interest and they like to enhance their social network wherever they visit, which might sometimes help them in earning more profit in their own profession, thus making traveling a good source of setting up social network which can open new opportunities both for the people in cities where people visit and people who like to visit. Here is a recommender system which suggests travel plan based on personal interest and helps enhance social network wherever a traveler visits.

Key words: Travel Package Recommendation, Personalized Recommender Systems Travelling, Travel Schedule Recommender

I. INTRODUCTION

When we have user's hobbies, profession, preferences or travel demands, Physical constraints (like distance, budget) then how can we make a travel package which can consider user requirements and physical constraints into consideration.

There are many Travel package recommender Systems of variety, which take different parameters into account to recommend Travel package. This system accomplishes the task of recommending Personalized Travel package, by including personal choices, recommending complete travel plan taking time and distance in to account, suggesting maximum travel expenses from a central location, giving the option of checking nearest company dealers of personal interest and profession, checking popularity of any point of interest. Other recommender systems are generally stiff, that is, they recommend scheduled travel plan according to available time span. This recommender system recommends Plan according to Distance limit, that is a maximum distance limit of 250kms will include all the options suited for the traveler according to his interests and preferences. To consider best time, this recommender system suggests best time, best season to visit that location along with the budget that will be required to travel to that location from a central location of the city. Other recommender systems suggest one option for a particular time span, and it includes stay times, but this system suggests a location's best visit time and includes all available locations in same time span if they are available, no stay time is included, because this is a recommender system, it takes mainly user interests and distances of between the locations to give a suggestion. Such a system gives user the facility to plan a trip which can be varied at any point of time, it can be shortened, or extended and still his recommendations will be according to his personalized area of interest. Travel recommender systems rarely include company dealer options. This system suggests nearest dealers of interest to traveler. This facility helps travelers to

develop a social network which can be beneficial for his profession, and interest. To suggest popularity of a particular visiting location, comments given by travelers are mined and on its basis a dynamic graph is shown, which suggests that according to how many users the visiting location was best, good, average, bad or worst. This helps travelers to take a decision if they are planning to visit or skip to visit that location

II. PROBLEM DEFINITION

There are certain main questions while planning a travel:

- Q1. Where should I go?
- Q2. How many places can I visit in a particular time span and distance?
- Q3. What can be an appropriate Visiting Sequence?
- Q4. What can be the maximum budget on an average?
- Q5. Can there be any other benefits of travelling to a particular place?
- Q6. Is the place really good or not according to other travelers ?

We can't get answers of these questions directly so we correlated travelling and traveler's interests, previous preferences, location popularity index, and on the basis of the hidden clues we we aggregated information important to us for developing travel package and thus we generated customized travel package.

III. PROPOSED WORK

A. Data Collection:

Data set is taken from location based social network where all the tourists, company holders register their information, they share locations, write comments, give ratings, send and receive friend requests.

We focused on variety of types of locations which can be for Businessman, Government employee, Self employed, Student, professional, retired, home maker, for the people who are interested in food, entertainment, music, shopping, adventure, education, arts, sports, history or mythology.

There are 7 types of professions and 11 types of hobbies considered here, on the basis of which we will be able to find personal interest of the traveler.

B. User Preference Modeling

User preferences are time dependent means same user can be interested in visiting different locations in different time periods.

For example people prefer going to temples, sight seeing in the morning time, having good lunch in the afternoon, and relax, some garden, temple, in evening, some mall, market or show in night time.

To take preferences of time dependencies, a day is divided in to four time spans: Morning, Daytime, Evening time, and Night time. After this user's preferences is

characterized and is assigned a time period from four time spans.

These time spans are not strict as from 8 am to 10 am etc, Morning time is mentioned considering the flexibility of schedule of traveler. User preferences are checked by hobbies, Profession, Previous interests. User profile is made and travel plan is suggested on the basis of 18 types available of profession and hobby.

We calculate user preference for each location category using(1). It is modeled as the weight of each dimension of the feature vector for this type of location. F_{ck} is the user's preference of the C_k th location category of type i , and $VC(u, r, o)$ is the number of times that user u has liked location o

$$F_{ck} = \frac{o \in C_k \vee VC(u, r, o)}{o \in i \vee VC(u, r, o)}, \quad k = 1, 2, \dots, |i|. \quad (1)$$

C. Location Popularity

The popularity of locations is important in location recommendation. Location popularity does not necessarily remain constant For example, a botanical garden usually attracts more visitors in spring than during winter. Therefore, we need to consider when calculating location popularity. We calculate the popularity of all locations dynamically on the basis of comments given by travellers.

$$H(o) = \text{AVG}(\text{liking}(o) + \text{opinion}(o)) \quad (2)$$

We define the popularity of location o by equation 2

D. Point-of-Interest Discovering and Ranking

The first step in generating the travel package is to obtain a set of POIs that the users might be interested in.

1) Point-of-Interest Discovery:

The POIs that the users might visit are time-dependent. To discover candidate POIs, we divide the travel duration into several time periods. Let T_s and T_e represent the start time and end time;

we denote the list of time periods that the travel crosses as TimeList :

$$\text{TimeList} = \langle (T_{s1}, T_{e1}), (T_{s2}, T_{e2}), \dots, (T_{sk}, T_{ek}) \rangle.$$

Then, we can find the preferred type of locations for each time period, according to the user's profile.

Point of interest is judged on the basis of Hobbies and Profession of the user. This basis can judge interest of the user in a better manner than other attributes. The order of preferences in the travel plan will be according to distances. The order of preferences in the suggestions will be on the basis of previous interest of traveler in that location or travelled locations

2) Point-of-Interest Ranking:

For each time period, we select the appropriate POIs from the discovered POI set as the candidate locations for route planning. We rank these POIs according to user preference

E. Travel Route Planning

- 1) INPUT: User u , Start Point P , Start Time T_s , Starting Location distance attributes (lat and lon) D_s
- 2) OUTPUT: Path Tree PT
- 3) INIT $P.d = D_s$, $PT \leftarrow P$, $OPENSET \leftarrow P$
- 4) WHILE $OPENSET \neq \text{NULL}$
- 5) $x = \text{Header of } OPENSET$
- 6) Remove x from $OPENSET$
- 7) FOR y IN $\text{candidate}(x)$
- 8) Simulate Distance = $x.d + \text{Move}(x, y) + \text{Stay}(y)$

- 9) IF $P(x, y) > \text{Threshold}$ AND $\text{SimulateDist} < 250$
- 10) $y.d = \text{SimulateDist}$
- 11) $OPENSET \leftarrow y$
- 12) $PT \leftarrow y$
- 13) ENDF
- 14) ENDFOR
- 15) ENDWHILE

This is the algorithm followed to recommend travel package.

To generate a graph on how is a location, SVM algorithm is used to mine the reviews of people about a place.

IV. CONCLUSION

The approach used here needs a lot of improvement. Here the idea of inclusion of suggesting nearest dealers allows dealers around visiting places to connect to travelers which is good from the perspective of financial profit and social network expansion. As the system is only for suggestion and no time span boundation is kept for recommending travel plan. As on the basis of opinion analysis graph is made, this will tell true importance of that location.

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