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A Survey on Social Media Based Personalized Travel Sequence Recommendation

Prof. Sarita Sapkal, Jakil Syed, Ishan Gonekar, Santosh Dhaigude, Amit Langore

Department of Computer Engineering, MMCOE, Pune, Maharashtra, India

ABSTRACT: A proposed personalized travel sequence recommendation system uses user's Facebook data like tags of photos, location of places visited by user, for mining POI, to recommend the topical interest, cost, time and season. Point of interest is the interest of different travellers. According to tourists, point of interest varies. Some tourists have interest in historical places, and some may have their interest in religious, entertainment, hotels, zoo's etc. The rapid growth of online travel information imposes an increasing challenges for packages to satisfy their personalized requirements. On the other side, to get more business and profit, the travel companies have to understand these preferences from different tourists for serving more attractive packages. Proposed System is not only personalizing to users travelling interest but also able to recommend a travel sequence rather than individual Points of Interest (POIs). System consider both users check-in and routes textual descriptions to the topical package space to get user's topical package model and route topical package model (i.e., topical interest, cost, time and season). Proposed system will Book the user package. In that user will get all cost for the mined places and will view route on map from user current location.

KEYWORDS: Point of Interest, Location-Based Collaborative Filtering, Application Programming Interface, Location Based Social Network, Geo-Tagged Photos, Global Positioning System, Social Media Facebook API, Multimedia Information Retrieval, Travel Recommendation.

I. INTRODUCTION

Automatic travel recommendation is a main issue in both research and industry. Big media, especially the flourish of social media (e.g., Facebook, Flickr, Twitter etc.) offers great opportunities to address many challenging problems, for instance, GPS estimation and travel recommendation. These data are not only useful for reliable POIs mining, travel routes mining, but it gives an opportunity to recommend personalized travel sequence and routes based on user's interest. There are two main challenges for automatic and personalized travel recommendation to user according to POIs since different users may prefer different types of POIs. Second, it is important to recommend a sequential travel route (i.e., a sequence of POIs) rather than individual POI. It is far more difficult and time consuming for users to plan travel sequence than individual POIs. Because the relationship between the locations and opening time of different places should be considered. Existing studies on travel recommendation mining, famous travel POIs and routes are mainly focused from four kinds of big social media, GPS trajectory, check-in data, geo-tags and blogs (travelogues).

II. MOTIVATION

Automatic travel recommendation is an important problem in both research and industry. There are two main challenges for automatic travel recommendation. First, the recommended POIs should be personalized to user's interest since different users may prefer different types of POIs. Second, it is important to recommend a sequential travel route rather than individual POI. It is far more difficult and time consuming for users to plan travel sequence than individual POIs. For example, it may still not be a good recommendation if all the POIs recommended for one day are in four corners of the city, even though the user may be interested in all the individual POIs. general travel route planning cannot well meet user's personal requirements. Personalized travel recommendation recommends the POIs and routes by mining user's travel records.

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III. REVIEW OF LITERATURE

Shuhui Jiang, et al [1] Presented a personalized travel sequence recommendation system by learning topical package model from big multi-source social media, travelogues and community contributed photos. The advantages of this system are automatically mining user's and route's travel topical preferences including the topical interest, cost, time and season. They recommended not only POIs but also travel sequence.

JungeShen, et al [2] Proposed system that works on a novel query-dependent landmark ranking system based on heterogeneous travel information fusion to facilitate a smart travel guide. This system gets the initial ranking list of landmarks via text matching. The advantage is, maximize the satisfaction and minimize the information load. Less efficiency is a disadvantage of this paper.

Shuhui Jiang, et al [3] Author has proposed topic model-based collaborative filtering Personalized POI Recommendations method is proposed to facilitate comprehensive POIs recommendations for social users. The disadvantage is, dataset is small. Only textual information of geo-tagged is given.

HuijiGao, Jiliang Tang, et al [4] Author has presented system content information on LBSNs with respect to POI properties, user interests, and sentiment indications. Model the three types of information under a unified POI recommendation framework with the consideration of their relationship to check-in actions. The advantage is, user behaviour, and demonstrates its power to improve POI recommendation performance on LBSNs. And the disadvantage is contain only small dataset .

Quan Yuan, Gao Cong, et al [5] Presented the system worked on the problem of time-aware POI recommendation, which aims at recommending a list of POIs for a user to visit at a given time. To exploit both geographical and temporal influences in time-aware POI recommendation. The disadvantage is taken a more time.

Jing Li, XuemingQian, et al [6] Author has Presented the system is an unsupervised image GPS location estimation approach with hierarchical global feature clustering and local feature refinement. Consist of two parts: offline system and online system. The disadvantage is in online system data should be not secured .

Yang Ji, Chunhong Zhang, et al [7] Author has presented System is to mine user daily behaviour based on a user's location history. Time- clustering-based behaviour analyses are proposed to model each individual's location history and mine the regularity in daily activities.

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IV. SYSTEM OVERVIEW

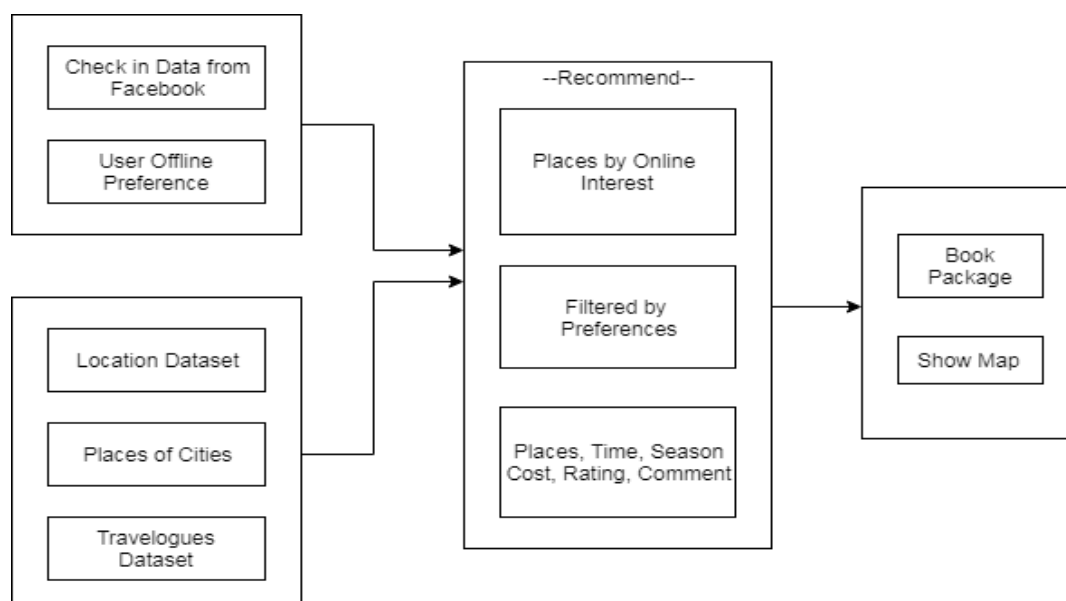


Fig.1: System architecture

Fig.1, Shows that, system mines users POI From Facebook. For that user have to register with the token obtained from Facebook developer API. Admin can login to system and add places according to each place in city. Admin can view the user's details as well as each user's POI. Users can register to the system with his Facebook developer access token that's used to get user's Facebook data and from that system will mine user's POI by Levenshtein Distance Algorithm .To generate Facebook token user have to login with his Facebook account's login credentials i.e. username and password. User can add travelogues details and his community contributed photos. Travelogues details are used to show preferred season for travelling. From dataset travelogues are mined to show time, season, cost for each place. When user enters the query to search places system will provide the details according to user's preference which is obtained at the time of registration. User can give rating, comments to each place. User can get optimized package according to his preference of similar user. User can view places recommendation by Rating, Online interest, Preference, activity, Season .User can view his package that contain best season, cost, preference and package details. User can also view package by selecting his POI. User can view places on map.

V. ADVANTAGES

1. System will recommend places by mining user's online POI from the Facebook data and show the places depending on POI.
2. User can able to update his POI after some days. It also gives recommendation using similar user interest and according to that gives recommendation to user.
3. User can use filter for searching places.
4. System will show the places on the map after selecting the package.

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VI. MATHEMATICAL MODEL

Let us consider S , S be the system that automatically recommend the places according to the user's POI. System will obtain the POI from the token entered by the user at the time of user registration.

$S = \{I, F, O, Sc, Fc\}$

Where,

$I = \{i1, i2, i3, \dots, i_n\}$ 'I' sets of inputs to the system

$i1$ = For login ,User_id and password.

$i2$ = Token from Facebook API

$i3$ = Name of the place to be visited.

$F = \{f1, f2, f3, \dots, f_n\}$ 'F' is a set of functions

$f1$ = User Registration.

$f2$ = User Login.

$f3$ = Token Update.

$f4$ = Add Places.

$f5$ = Search places.

$O = \{o1, o2, o3, \dots, o_n\}$ 'O' Set of outputs from the system

$o1$ = Recommended places.

$o2$ = Cost, time, season, etc of all tour.

$o3$ = Map from source(current location) to destination.

Sc = Success Case.

i.e Recommend the route of selected places.

Fc = Failure Case.

i.e Issues occurred during the recommendation

VII. ALGORITHMS

There are many different algorithms for text pattern matching such as Aho-corasick algorithm, Comment-Walter algorithm, Rabin-Karp algorithm, Boyer-Morris algorithm, Backward oracle matching algorithm, Levenshtein Distance Algorithm. For implementing this system we have used Levenshtein Distance Algorithm. This algorithm is also called as Edit Distance algorithm. Edit Distance algorithm counts the number of insertions, deletions and substitutions needed to transform one string to other. It uses technique of dynamic programming algorithm. The efficiency of other algorithms such as Aho-corasick is less as compared to Levenshtein Distance Algorithm. Aho-corasick returns the output if and only if there is 100% matching in both strings (source and destination string). And also Aho-corasick requires large amount of memory for straight forward implementation. Whereas Levenshtein Distance Algorithm gives results even after partial matching of strings.

LEVENSHTEIN DISTANCE ALGORITHM

This is used to get POI mining from data which we get from Facebook at the Time of registration.

1. Input:

1. Text string $s1 = a1$ for matching.

2. Text string $t1 =$ Data from Facebook.

3. Distance to match string $s1$ with string $t1$.

2. Processing: System will get POI as string and will match that string in Facebook data according to specified distance.

3. Output : Count i.e. number of times string matched with Facebook data.

$D(i,j)$ = score of best alignment from $s1..si$ to $t1..t$

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$$D[i,j] = \min \left\{ \begin{array}{l} D(i-1,j-1), \text{ if } s_i=t_j \text{ //copy} \\ D(i-1,j-1)+1, \text{ if } s_i \neq t_j \text{ //substitute} \\ D(i-1,j)+1 \text{ //insert} \\ D(i,j-1)+1 \text{ //delete} \end{array} \right.$$

Where,

D(i,j) represents the distance between two strings i and j.

```

int m[i,j]=0
for i ← 1 to |s1|
do m[i,0]=i
for j ← 1 to |s2|
do m[0,j]=j
for i ← 1 to |s1|
do for j ← 1 to |s2|
do m[i,j]=min{m[i-1,j-1]+if(s1[i]=s2[j])then
0 else 1 fi,
m[i-1,j]+1,
m[i,j-1]+1}
return m [|s1|,|s2|]

```

VIII. EXPERIMENT RESULT

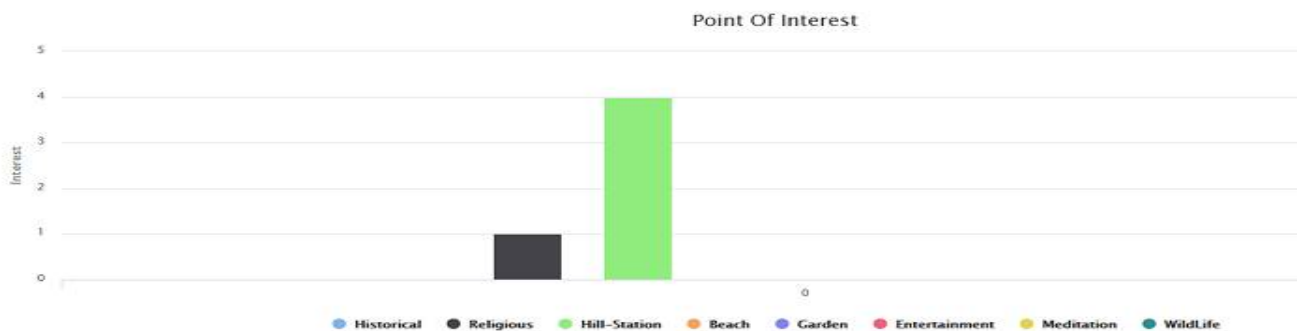


Fig2. Point of Interest



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Fig2. Shows the graph of the user’s Point of Interest. Above figure clearly indicates that user has more interest in Hill-Station than Religious.



Fig3. Graph

Fig3. Shows number of searches for each city ina different season for one month.

RESULT TABLE:

	Summer	Winter	Rainy
Pune	5	0	65
Mumbai	2	0	0
Chandigarh	0	0	0
Jaipur	0	0	0
Bengaluru	0	0	3

Table 1.Result

Fig3. Shows number of searches for each city ina different season for one month.

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IX. CONCLUSION

In this paper, we have proposed a personalized travel sequence recommendation system by mining POIs of users from social media. The personalized travel sequence recommendation system automatically mines user's travel preferences including the regional interest, city, cost, time and season. System recommends not only POI based travel sequence it also recommend the places on the basis of various filters such as, considering users travel preferences, activity , online interest at the same time. It also provides map of the user's selected places. System mines places based on the similarity between user's POI. Finally map of travel sequence (i.e. selected places) is provided from current location to the destination including all selected places i.e. the user's package.

X. FUTURE WORK

In future, we plan to enlarge the dataset, and thus we could do the recommendation for some non-famous cities. In future we will add some non-famous cities, having the most beautiful places but that may not be visited by the peoples or that can be unknown to the tourists but that will be made famous after visiting them. We plan to utilize more kinds of social media (twitter, Instagram, Flickr), and also we are planning to find the point of interest of user from images which are tagged on various social medias such as Instagram, Flickr, Facebook.

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