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Tour Recommendation Guide- Personalized travel sequence recommendation

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Abstract. Presents a personalized travel sequence for the given area the individual wants to visit. It not only helps to personalize the travel but also recommend a travel sequence based on the area mentioned. Firstly the frequently visited routes are ranked then top ranked routes are chosen based on previous travel records. The data is being collected using data mining and the famous routes are ranked based on user and the route. It helps in bridging the gap between user travel preference and routes.

1. Introduction

Travelling has now become everyone's interest. With our population expanding and places to accommodate people is increasing there are many new places that many people are keen to visit. As we know there are many sites that help people to book tickets to places they want to visit and also book rooms to stay without the need of visiting the place all by themselves.

Unlike most existing travel recommendation methods, this method also helps in providing a more personal way of travel sequence to user's travel interest based on Points of Interest (POIs). The two main challenges for tour recommendation guide are. First, the recommended POIs should be personalized to based on the individuals interest as different individuals may have different types of POIs. To recommend a sequence

- i. Famous routes are ranked according to the similar space between user specified interest and existing route details. Then frequently visited routes are optimized by other users' travel details. Related images with user specified POIs are displayed.
- ii. It is important to recommend a sequence of routes other than user given POI. It is a tough and more time consuming task for users to plan their travel sequence than their POIs.

Most of the existing systems focus more on famous route mining than focusing on mining user's travel interest. It is a tough task to provide user with more personal and sequence for their travel. Combining user interest, cost, time, season with user interest is the main task. Ranking of frequently accessed routes will be done. Identifying the most frequently accessed routes by user travel records is collected by the similarity in other user packages.

1.1. Ease of Use

Searching based on category

Once the registered user logs in he can now search for places that he would like visit and during a particular season and it totally depends on the interest of the user. Interest of user may include season of visit of a particular place or a place like park, beach or a temple.

Counting the frequency

When a user searches based on category, frequently visited places by other users are first displayed this is ranking based searching and is implemented using the Apriori algorithm.

2. Related Work

Trip planning is generally a time taking task because of lack of efficient tools and systems that are made available to the common users. Huagang Yin et Al., propose a travel path search system based on geo-tagged photos to help tourists; trip planning, suggests where to visit and also how. The collection of photos which are publicly available in the internet helps the system in mining travel path from previous records [1].



Location of images has been used in many applications for tagged images. Images which are not tagged with location, estimation of their location with the help of geo-tagged images done. In this paper, Xueming Qian et Al. identify words and converts to image location [2].

Social media has continuous needs for travel recommendations. Shuhui Jiang et Al. [3], has proposed to facilitate comprehensive points of interest (POIs) recommendations for users. Here user specified topics like temples, parks, beaches are extracted from the tagged images and mapped using GPS.

Social media is now a very popular way in which people share their photos. GPS information is found using tagged images using visual searching method. Jing Li et Al.[4] has proposed a GPS location estimation with the help of images. With the help of input image, the GPS details can be identified and feature refinement in the online system is done.

The fast expansion of cities has increased the user living area and created number of POIs (points of interest). POI recommendation helps in facilitating user exploration and filter POIs. Huiji Gao et Al.[5], has proposed POI recommendation on location-based social networks that identify the user behaviour.

3. System Model and Framework

We are proposing a web application that can be used by all registered users who are keen in travelling to different places and explore various features of a particular place they are visiting. This application mainly focuses on recommending a tour to the user only based on their Point Of Interest, this can be based on season they are most likely to visit or places like temples, beach, park or restaurants.

The system mainly consist of admin who can keep updating the databases like adding new places, view the users who have requested for a trip, update tour details and also view places that are stored in the databases. The next main purpose is that the user can register and then go through the available categories to search and based on their interest the user can now request for a tour and wait for the confirmation from the admin.

4. Implementation

The proposed system is implemented using java language with java server pages and html with JavaScript as front end and servlet as backend. We also store all the data which are regularly updated in mysql. We have used glassfish server. The working can be expressed with the modules described.

4.1 Creating database

- Admin table has the details of the admin user name and password
- New user registration table has the details of all the new users who are registering
- Plan table has the list of users who's trips have been requested along with their confirmed/not confirmed status.

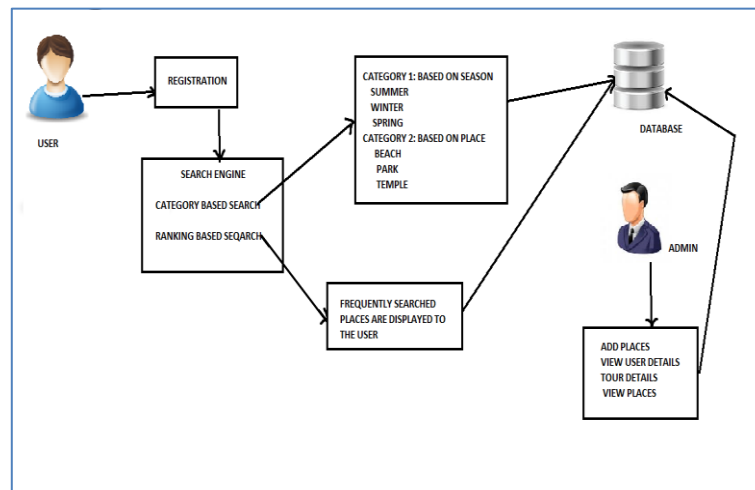


Fig. 1. System architecture

4.2 Creating GUI

- Home page consisting of images of attractive places in tamil nadu and description about our state
- User registration page has tabs that has to be filled by the user to search for places and book a trip
- Admin page is where the admin enters the user name and password to access his options
- User login page is where the registered users can login and request for a trip

4.3 Admin

- Can check user details, tour details, add places and view places.
- Each of these options have tables linked to them and on choosing any of the option the related table is chosen and the data stored in it is collected and displayed.
- All the details of tours that are requested , status of tours (confirmed/not confirmed) and the details of users who have requested for the tours.

4.4 User

Registered users can search places, book a trip and check routes. Any request given by the user is saved into the tables, this data is collected by the admin to either confirm or not confirm the trip.

Category based search - In this search technique the user can search based on category (place-beach, park: season-summer, spring) and on doing so the related data is retrieved for the database and is displayed to the user. The searching process is carried out using KNN algorithm depicted in fig.3.

KNN Algorithm

Step 1: Start

Step 2: initialize and define k(k is the number of neighbours, k can have values from 1...n)

Step 3: Compute the distance between the input sample and the training samples using Euclidian Distance Formula given in Fig.2 i.e.

$$d(\mathbf{p}, \mathbf{q}) = d(\mathbf{q}, \mathbf{p}) = \sqrt{(q_1 - p_1)^2 + (q_2 - p_2)^2 + \dots + (q_n - p_n)^2}$$

$$= \sqrt{\sum_{i=1}^n (q_i - p_i)^2}.$$

Fig.2 KNN Distance Equation

Step 4 : Sort the distances

Step 5: Take the nearest neighbours

Step 6:Apply simple majority helps in predicting the query instance.

Step 7: End

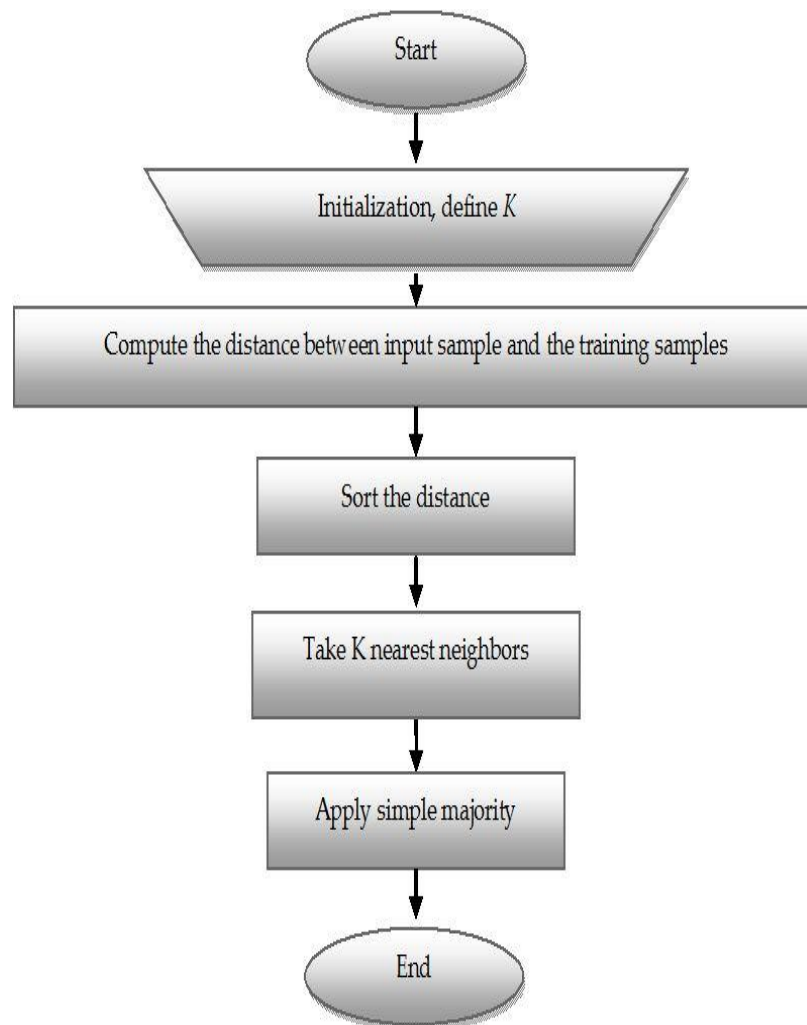


Fig. 3. KNN Algorithm

Ranking based search – When a user searches based on category, frequently visited places by other users are first displayed this is ranking based searching and is implemented using the Apriori algorithm depicted in fig.4.

Apriori Algorithm

Step 1: Start

Step 2: Read each item in a transaction

Step 3: Support of every item is being calculated

Step 4: If the support value is greater than or equal to the minimum support value then the items are inserted in to the frequent item set.

Step 5: If the support value is lesser than the minimum support value then the items are removed

Step 6: Confidence for each non empty sub set is found.

Step 7: If confidence is greater than the minimum confidence then they are inserted in to strong rules.

Step 8: If confidence is lesser than the minimum confidence then the subset is removed.

Step 9: End

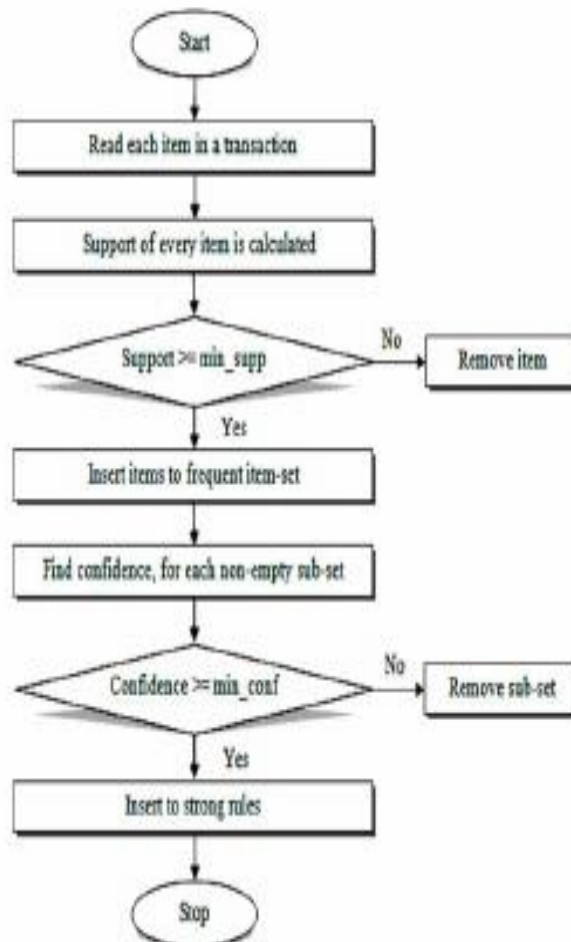


Fig.4. Apriori Algorithm

5. Result Analysis

The proposed approach uses 2 algorithms to implement two main functionalities into the project namely KNN and Apriori to perform category based search and ranking based search respectively. Both the algorithm helps the user in identifying the best place that the user can visit in a particular season so that their trip can be good one.

The graph in fig.5 compares 4 different route recommendation methods, they are Random route planning (RAM), Famous routes planning (FAM), Ranked famous route(RFA) and Optimized routes planning(OPT).

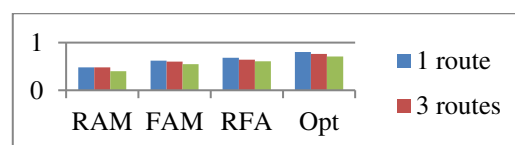


Fig. 5. Chart comparing different route analyzing methods

RAM-method helps in identifying routes to desired place by randomly selecting places.

FAM-method identifies route to destination without any method for ranking and optimizing route.

RFA-method suggest routes based on users previous travel records.

OPT-method has entire route suggestion that holds ranking of route and optimizing route.

Out of the 4 described methods OPT finds to be more accurate and has the highest values of all. So the method that is being used in the project is more accurate and hence this method is the best one out of all.

6. Conclusion

In this paper we propose an easy way to the users to request for a tour based on their own Point Of Interest, there are many existing applications that provide users to check for their trips but not all of them focus on letting the user decide in which season they would like to visit or which category of place they would like to visit. Users can very comfortable search for places and have a category based searching method that will help them to easily go through the places and request for a tour.

In future we will further develop our idea in the following aspects: Many more categories will be added so that user can search more precisely. Response to users request by the admin will be given more quickly. Sequence of visit to places will be displayed when the user gives the starting and ending point of their trip.

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References

- [1] Huagang Yin , Changhu Wang , Nenghai Yu and Lei Zhang, 2012 *Trip Mining and recommendation from Geo-tagged Photos* Proc. IEEE Int. Conf. Multimedia Expo Workshops, pp. 540-545.
- [2] Xueming Qian, Yisi Zhao and Junwei Han 2015 *Image Location Estimation by Salient Region Matching* IEEE Trans. Image Process., vol. **24**, no. 11, pp. 4348-4358.
- [3] Shuhui Jiang , Xueming Qian , Jialie Shen , Yun Fu and Tao Mei 2015 *Author Topic Model-Based Collaborative Filtering for Personalized POI Recommendations* IEEE Trans. Multimedia, vol. **17**, no. 6, pp. 907-918.
- [4] Jing Li , Xueming Qian , Yuan Yan Tang , Linjun Yang and Tao Mei 2013 *GPS Estimation for Places of Interest From Social Users' Uploaded Photos* IEEE Trans. Multimedia, vol. **15**, no. 8, pp. 2058-2071.
- [5] H. Gao, J. Tang, X. Hu, H. Liu, and Quot 2015 *Content-aware point of interest recommendation on location-based social networks*, Proc. 29th Int. Conf. AAAI pp. 1721-1727.
- [6] Q. Yuan, G. Cong, A. Sun and Quot 2014 *Graph-based point-of-interest recommendation with geographical and temporal influences* , Proc. 23rd ACM Int. Conf. Inform. Knowledge Management, pp. 659-668.