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An Efficient Travel Recommendation system using Complex networks, Tripartite graph clustering and ACCC algorithm to overcome computational complexity

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Abstract

The photos of users with Geo-tagging on social media sites (e.g., Flickr, Fotki, Photo Bucket) and apps (e.g., Instagram, Bayimg, Fotolog) provide abundant data based on the location. The data which is available there provide an abundant wealth of information about user behaviour statistics and their potential is increasing, as it becomes common for images to be associated with location information in the form of geo-tags. To recommend tourist locations, there is an increasing tendency to adopt the information from these geo-tagged photos for learning.

In this paper, we are going to propose a system procedure for recommending interesting tourist locations and tourist travel sequences (i.e., order of tourist locations) from a set of geotagged photos. Proposed system is capable of understanding context by taking into account the collective wisdom of people, to make tourist recommendations as well as considering real time parameters (i.e., time, date, and weather). We illustrate our technique on a sample of public Flickr data set.

The results of experiment demonstrate that this approach is able to produce better recommendations as compared to other fore-front landmark based advocacy methods.

Keywords: Travel recommendation, Geo-Tagged photos, Trip planning, Travel Sequence.

Introduction

This recommendation system is designed such a way that completely depends on the geo-tagged photos. Based on the details of the image the system generates the recommended travel sequences.

For example, the images in Flickr will have certain specific format.

The format is,

<Photo Info UserId=”31622436”>
<PhotoId=”2290004675”>
<Width>375 <Height>500`
<Tag>paris
<Tag>france
<Tag>eiffeltower
<DateTaken>2008-02-24 21:33:38
<Latitude>48.857232
<Longitude>2.296603

Using the Flickr dataset, the UserId is used to guess the nature of the user, POI and frequent visit. Latitude and longitude are to locate the place. By this information the system can sort the travel sequence accordingly. Using La and Lt, the system can get the season and weather information via Web Service. It is also useful when user didn’t describe about the location in words.

Travel Recommendation System Framework:
List the interesting locations using Complex networks, tripartite graph clustering and ACCC algorithm to overcome computational complexity.
Framework:

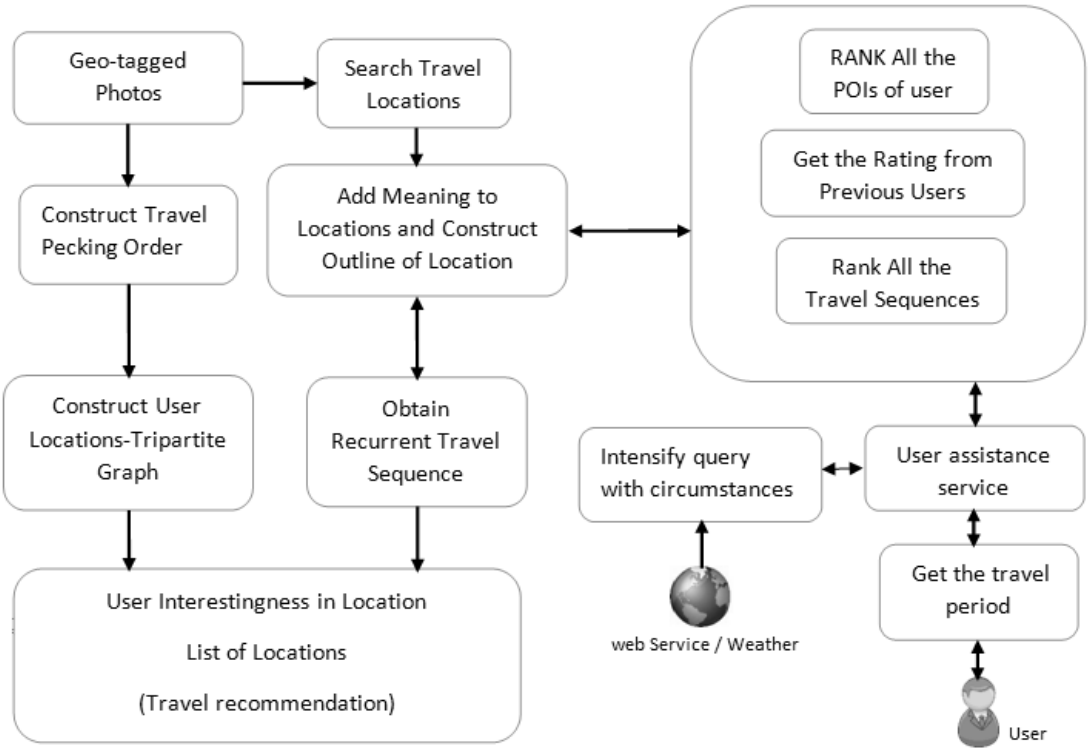

Fig: 1 Context-aware recommendation from geo-tagged media

Travel Recommendation System:
The Fig.1 represents the complete process of getting the valid information of the places to be visit by the user as per his queries. The system completely based on the requirements of the user and gives the most efficient results by using algorithms (like GPS Trajectories, Placing Search in Context).

Ranking Methods:
Diversified Trajectory Pattern Ranking in Geo-Tagged Social Media is used to rank the recommended places and also it can ask the user to review about the trip after his completion which helps others to take decisions and all this is done by using sequential pattern mining and propose a ranking strategy that considers the relationships among user, location and trajectory.

User Query/Input:
The system is proposed in a manner where it asks user to give the details like period of travels, places they want to visit and kind of places they want to visit (like adventurous, spiritual) based on that the search is more particular about the kind of places and removes the unnecessary place between the sequence.

User Assistance Service:
A mobile tourist assistance system based in **complex networks** is used to assist the user form the given details. It also recommends the user to change the sequence if there exists any better sequence than user mentioned.it uses the database and the data structures to find the path. Collaborative path finding strategy is used to join the sequence with the given places so it makes the travel sequence in a sequential manner which makes user to travel in the best path.

Intensify Query With Circumstances:
The Context based search is used to intensify the search .It is done by using semantic processing, Heuristic Query Augmentation System, Linguistic CBS System .In this process the search is intensified by using above algorithms and the user can have a clear idea about the sequence.

Geo tagged photos:
It is the place where all the images are stored in the database. The user can upload the pictures of his trip and he can write his suggestions about his trip. This makes the others to know about the trip and they can travel if they like it. The images in the database is manipulated by different algorithms according to the given constraints so as to know the interesting location of a particular user.Flickr is one of the major source where the images can be uploaded into the database which makes ease to access the existing photos rather than creating new one.

Search Places:
Search places are the places where the places are been searched from the database according to the user constraints. Here we can use refine search by either time,date constraints are by interestingness of the user .Mobile Image searching using ACCC algorithm(**Auto Color Correlogram and Correlation**) is one of the latest technique where the user when he can't express his places to visit he can search using images.it also provide guidance for travelling .

Constructing Travel Pecking Order:
Though user know the places to be travelled it is quite difficult to travel the trip sequence because of lack of knowledge on distance, route, climate etc., So we

introduced a technique to mine the travelling locations by using GPS trajectories. Here it first model every single locations where it builds hierarchal graph to form the sequential order following constraints like distance, time then the following sequence is again reconstructed to get the best sequence.

Construct user locations-multilateral graph:
The whole data is residing in the database where it is difficult to search for a particular user mentioned trip so by constrained information there will be creating a **tripartite graph** where the data is stored in the form of cluster. Here Searching is easy because cluster is having only data which maintaining some semantic similar relations with the given constraint .It takes less time to search because all similar data are resting in a cluster and no need of searching each and every data which is present.

User interestingness in location:
The final information wanted by the user is then viewed in a list of locations where he can choose any one according to his willingness. so finally user can be travelled to his required destinations by using the above algorithms.

Conclusion:
The main purpose of the above proposed system is to establish a useful travel recommendation system to the user who is willing to plan a trip. All this is done by the above proposed system components where each uses their own algorithms to fulfil the needs of the user. At first the user data and travel period and the other details like ranking are gathered then from the other end the geo-tagged photos are used search the places and add a meaningful order of sequence which also checks for recurrent travel and other conditions like weather. The geo-tagged photos are also used for construct a tripartite graph i.e. hierarchical graph of the places to be visited and pecking order of the trip and the resulting information is forwarded to the user which makes him to choose a sequence of travel from a list of recommendations.

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