**IMPLEMENTATION**

**MODULES:**

* Social Media Mining System Construction
* User Topical Package Model Mining
* Route Package Mining
* Travel sequence recommendation

**MODULES DESCSRIPTION:**

**Social Media Mining System Construction**

* In the first module we develop the system for the evaluation of our proposed model and thus make the system construction module with social media mining system.
* Our topic package space is the extension of textual descriptions of topics such as ODP. We use the topical package space to measure the similarity of the user topical model package (user package) and the route topical model package (route package). In our paper, we construct the topical package space by the combination of two social media: travelogues and community-contribute photos. To construct topical package space, travelogues are used to mine representative tags, distribution of cost and visiting time of each topic, while community-contributed photos are used to mine distribution of visiting time of each topic.
* The reasons for using the combination of social media are (1) travelogues are more comprehensive to describe a location than the tags with the photos which are with so many noises; (2) it is difficult to mine a user’s consumption capability and the cost of POIs directly by the photos or the tags with the photos; (3) to season, although both media could offer correct visiting season information of POIs, the number of photos of a POI is far larger than the number of travelogues. (4) the time difference between where the user lives and the “data taken” of community contributed photos of where he or she visits make the taken time inaccurate.

**User Topical Package Model Mining**

* User topical package model (user package) is learnt from mapping the tags of user’s photos to topical package space. It contains user topical interest distribution   
  (U), user consumption capability (U), preferred travel time distribution (U) and preferred travel season distribution .
* In this module, we introduce how to extract the user package, which contains user topical interest distribution, user consumption capability distribution, preferred travel time distribution and preferred travel season distribution.
* First we introduce user’s topical interest mining from mapping user’s tags to the topical package space. Then, we introduce how to get topical space mapping method.
* We map the textual description (tags) of user‘s community photos to the topical package space to present the user’s travel preference of different topics, which is defined as user topical interest distribution. We assume that if a user’s tags appear frequently in one topic and less in others, the user has a higher interest towards this topic.
* We use the cost distributions of the all the topics and distribution of use’s topical interest to present a user’s consumption capability. If a user usually takes part in luxurious activities like Golf and Spas, his consumption capability is very likely to be. If a user usually takes part in some cheap things, his consumption capability is likely to be low, and we tend not to recommend him luxurious topics.

**Route Package Mining**

* Route topical package model (route package) is learnt from mapping the travelogues related to the POIs on the route to topical package space. It contains route topical interest, route’s cost distribution, route’s time distribution and season distribution.
* To save the online computing time, we mine travel routes and the attribute of the routes offline. After mining POIs, to construct travel routes, we analyze the spatio-temporal structure of the POIs among travelers’ records.
* We construct the spatio-temporal structure of the POIs according to the “data taken”. POI with the earlier timestamp is defined as the “in”. POI with a later timestamp, on the contrary, is defined as “out”. Then we count the times of “in” and “out” from POI to others by the records of all the users after filtering. A greedy algorithm is then applied to find the time sequence of these POIs. Thus, we finish famous routes mining and obtain famous routes of each city.

**Travel sequence recommendation**

* After mining user package and route package, in this module, we develop our travel routes recommendation module. It contains two main steps: (1) routes ranking according to the similarity between user package and routes packages, and (2) route optimizing according to similar social users’ records.
* After POI and route ranking module, we get a set of ranked routes. Here, we further describe the optimization of top ranked routes according to social similar users’ travel records. Firstly, we introduce how to mine social similar users and their travel records. Then we introduce how to optimize the roads by social users’ travel records.