

A Dynamic Tour Recommendation System Considering Implicit Information Of Point-of-Interest

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ABSTRACT

Tourism has become one of the world's largest service industries. With the popularization of tourism and the development of social media, more and more people prefer self-guided tours than package itinerary planned by travel agency. Some previous researches built their tourist recommendation systems based on optimization approaches or based on the user's historical travel information, however, some problems have been revealed. First, the clustering method in the past research can exploit some undiscovered POIs, but many parameters in the method cannot be determined easily. Second, the way that most of previous researches used to identify whether two POIs are similar or not can only find out the similar POIs. It might not be appropriate and may miss many potential related POIs. Third, to reduce the computational complexity of the system in the recommendation process, most previous researches clustered POIs into sub-groups based on whether POIs are ever visited or not. However, the POI visiting sequence cannot be addressed. Fourth, the staying time are assumed to be the same even it happened in different time slot. To solve the difficulties, a novel dynamic travel recommendation system that considering the implicit information of point-of-interest is proposed. We make more personalized travel recommendations based on the overall needs and user preferences. Our system collected the check-in records from the photos which uploaded to social media by users in various tourist attraction. For each check-in records, we will find out the POI which is closest to the user's check-in location, and consider the POI as the one he/she wants to visit. To provide users a personalized tour in our recommendation system, users will be further clustered into several dis-jointed sub-groups based on visiting sequence similarity. For each cluster, the user preference and the staying time will be calculated and prediction. The personalized itinerary is formed by a set of POIs that the user is interested. The summarization of all user preference in the itinerary will be utilized to evaluate where this itinerary is worth to be recommended to target user or not. The time limitation provided by the target user will be considered when conducting the itinerary planning. Finally, the itinerary with the highest score and the longest remaining time will be recommended. A set of experiments is conducted to show the precision of the recommendation system. It is found that the precision of the proposed system will increase when the number of

recommended POIs and the number of clusters increase. When w_{pop} is higher and w_{att} is lower, the precision will be higher. In addition, dynamic time mode into consideration can generate a longer itinerary than static time mode.

Key words: : Recommendation system 、 Implicit information 、 Personalized itinerary