

# A Travel Route Recommendation System Considering Visiting Time Information

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## ABSTRACT

With the rapid growth of the economy, more and more persons are willing to spend their budget on travel. This makes travelling become an indispensable leisure and entertainment in the life. Statistics show that number of travelers in Taiwan is increasing steadily every year. The tourism has experienced steady growth every year. Besides, most tourists prefer self-guided tour. To fulfill the need, a travel route recommendation system that provides users personalized itineraries is proposed in this study. At first, the photo dataset that people uploaded to social media is obtained. In order to provide meaningful trip route suggestion, the first stage is to cluster nearby geotagged locations of photos into landmarks using Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN). Second, in order to characterize landmarks, Latent Dirichlet Allocation (LDA) is adopted to extract landmark topics. Third, the visiting time of landmarks and their corresponding distribution are calculated. Then, the recommendation system is built on LSTM (long short-term memory) network. Based on the sequences learned and the particular user class to which the sequences belong to, the recommender predicts the next route and the visiting time. For new users that do not have any record in the system, the recommender can also make the route suggestion based on the user's preference for landmark topics. The experiment found that different visiting time spent in landmarks has a high influence on the recommendation result. In addition, different user's preference for landmark topics will impact the recommended routes.

Key words: Travel recommendation systems 、 LSTM 、 LDA 、 Personalized route