Solving Tourist Trip Design Problems from a User's Perspective

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Abstract

This position paper briefly motivates an abstract model for tourist trip design problems and outlines two scenarios we are working on: 1. a city trip planner to recommend a sequence of items for visiting a city, and 2. a travel region recommender for combining travel regions to recommend a composite trip.

1 Motivation, Abstract Model and Use Cases

Tourist Trip Design Problems (TTDP) deal with the task to support tourists in creating a trip composed of a set or sequence of points-of-interests (POIs) or other items related to travel (Gavalas et al. 2014). Often, the corresponding types of algorithms are optimized towards shortest paths or quickest traversal of locations. However, we argue that it is important to better consider the user's perspective and, for example, evaluate whether a more interesting or suitable POI is worth a detour. Thereby, the main research question is how to select, adapt and implement algorithms that will lead to the highest user satisfaction with the recommended trips.

An abstract model to solve TTDPs can be summarized in two steps:

1. Retrieving and scoring of items, based on user preferences and context
2. Combining and grouping the items to form a composite trip

We are working on sophisticated yet practical solutions to investigate TTDPs. Our first use scenario is a city trip planner to generate routes with POIs for a short city trip (Wörndl & Hefele 2016). In our web application[1], a user can enter a start and an end point along with preferences for POI categories (such as Food or Sights & Museums) and receives proposed walking routes with interesting places to visit along the way. For the first step, we retrieving

[1] Available at: http://citytrip.traveller-world.com (27.06.2016)

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rated POIs from Foursquare using their API. In the second step, the discovered places are then combined to walkable routes using a constraint-free and a constraint-based version of our algorithm. The conducted user study showed that users were satisfied with the results and also the match with their preferences (Wörndl & Hefele 2016).

The second use case is an approach to combine travel regions to recommend a composite trip for individual travelers (Ribeiro 2016)[2]. We are using a hierarchical data model of travel regions with manually complied attributes such as recommended months and. In the first step, the system calculates the similarity between a user query and the region attributes to score the available items. The second step then determines the best combination of regions within the budget and duration constraints by a Knapsack-based algorithm. The approach takes an adequate duration of stay per region into account.

One difference between the two use cases is that in the first case, the goal is to generate a sequence of items while in the second scenario the order of items is not so important and thus a set of suggested items is sufficient. This also influences the choice of algorithms needed to combine items in step two of our model. Challenges for future work include making the city trip planner more context-aware and develop a mobile application. We also plan to expand the scenario by considering round-trips and multiday itineraries. For the latter, one idea is to apply clustering after step one to group the items into daily chunks before generating a path. Both scenarios rely on single data sources at this time but different information sources could by integrated, for instance include flight options to a recommended region from a given start point. Finally, we are also working on better modeling and learning user preferences and personalizing recommendations.

References

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[2] Available at: http://regionrec.traveller-world.com (27.06.2016)