Spatially-aware routing and trip planning framework for a tourist

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Keywords: routing, trip planning, spatial clustering

When tourists visit a city or a region, there is always a trade-off between the number of points of interest (PoI) available and the ones that are eventually visited due to time, budget or other constraints. On the other hand, the tour plans suggested by common tourist recommender systems may not provide enough flexibility to make changes given the limited information of the spatial spread and modes of transport. Hence, there is a need to build spatially-aware systems that can suitably incorporate the PoIs, their categories and connectedness-accessibility factors in trip-generation.

This paper proposes an integrated trip planning framework, as a web-service, that integrates the location of PoIs and its auxiliary information in addition to using TPQs (trip planning queries) on spatial databases to provide a spatially-explicit multi-criteria trip planner with its corresponding routes. For instance, for a tourist with ten hours to spend in a new city, this framework would provide him a rank-optimized itinerary according to his interests. Given a global set of points of interest P in space, a starting point S, a destination D, and I is the set of interests of the given user, the proposed model would retrieve a best possible trip plan satisfying the user's interests and visually present the whole trip on a map. The framework involves both spatial clustering of the PoIs at multiple levels and a ranking algorithm, based on the users' preferences, to identify the optimal choice of PoI vis-à-vis its spatial occurrence. The auxiliary data like working hours, visit-time required, and time of arrival will be considered along with the transport network characteristics like network-distance, traffic, road conditions, and available transport. The work highlights the qualitative advantages of results obtained and challenges in developing and deploying such a system in the city of Hyderabad, India.