

General Time-Dependent Sequenced Route Queries in Road Networks

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Abstract : Spatial databases have been an active area of research over years. In this paper, we study how to answer the General Time-Dependent Sequenced Route queries. Given the origin and destination of a user over a time-dependent road network graph, an ordered list of categories of interests and a departure time interval, our goal is to find the minimum travel time path along with the best departure time that minimizes the total travel time from the source location to the given destination passing through a sequence of points of interests belonging to each of the specified categories of interest. The challenge of this problem is the added complexity to the optimal sequenced route queries, where we assume that first the road network is time dependent, and secondly the user defines a departure time interval instead of one single departure time instance. For processing general time-dependent sequenced route queries, we propose two solutions as Discrete-Time and Continuous-Time Sequenced Route approaches, finding approximate and exact solutions, respectively. Our proposed approaches traverse the road network based on A*-search paradigm equipped with an efficient heuristic function, for shrinking the search space. Extensive experiments are conducted to verify the efficiency of our proposed approaches.

Keywords : trip planning, time dependent, sequenced route query, road networks

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