Multi-criteria tourist trip planning

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Abstract

Plan a cycling-tourist trip over several days taking into account tourism features (ie greenways, points of interest, ...) or specific bike features (ie secure roads, distance, ...) can be a difficult task.

In collaboration with a French company ("La compagnie des Mobilités"), the aim of our research is to develop efficient methods for solving this problem in a short computation time. The problem can be defined as follows. From cyclist preferences, the goal is to find a route from predefined starting and arrival points, that can be follow by the cyclist in a given number of day N. This route should include N-1 stops at not predefined hotels and can pass by some points of interest to visit. Each point is characterized by a duration of visit, a time window where the site is open and a entrance charge. The cyclist preferences are a daily earlier departure time from the starting point or hotels, a daily maximum distance to travel, a daily maximum time that cyclist spent cycling and visiting, and a total maximum cost of the trip. Several criteria to evaluate a solution have to be taking into account: minimize the total traveling distance, maximize the safety of the roads, and maximize the tourist attraction related to the points of interest and the roads.The objective is to propose a set of non-dominated solutions satisfying all the constraints.

We will present an exact and an approximate methods for solving this problem, called the "Multi-Objective Orienteering Problem with Hotel Selection".

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