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Dynamic Routing of Short Transfer Baggage

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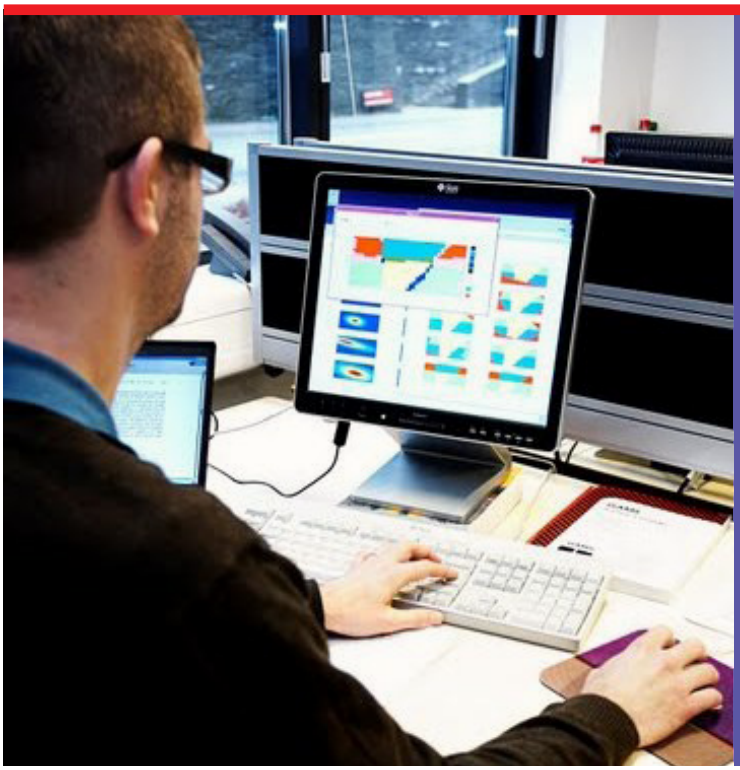
Dynamic Routing of Short Transfer Baggage



Report 15.2010

DTU Management Engineering

Tommy Clausen
David Pisinger
August 2010

DTU Management Engineering
Department of Management Engineering

We consider a variant of the Vehicle Routing Problem that arises in airports when transporting baggage for passengers with connecting flights. Each bag can be delivered in two locations with disjunctive time windows. The task is to define multiple trips for the vehicles in order to deliver bags that arrive continuously during the day. We present an IP model of the problem and describe the problem as a case study from a real life setting. We present a weighted greedy algorithm for dispatching vehicles that works in an dynamic context, meaning that it only considers bags available at the time of dispatch. Computational results are presented for real-life passenger data with stochastic bag arrival times and travel times.The results indicate that the algorithm is able to dispatch the baggage considerably better than the manual delivery plans reported in the case study, and due to its fast running times, the algorithm is suitable for dynamic dispatching. Investigations on the impact of uncertainty and fleet size make it possible to support a trade-off between fleet size and expected service level.

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