Séminaire conjoint / Joint Seminar
Chaire de recherche du Canada en logistique et en transport et
Chaire de recherche du Canada en distributique

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STOCHASTIC AND ROBUST VEHICLE ROUTING WITH DEADLINES

Résumé / Abstract : This study considers the vehicle routing problem with deadlines (VRP-D) under travel time uncertainty in the contexts of stochastic and robust optimization. This problem concerns the routing of a fleet of vehicles to serve a set of customers where deadlines are imposed at a subset of customers. In the stochastic VRP-D, the travel times along the arcs are characterized by probability distributions and the objective is to minimize the expected number of deadline violations. In the robust VRP-D, the exact distribution of travel time is unknown and some information such as minimum, maximum and mean values is available. The objective of this problem is to optimize a performance measure, called lateness index, which represents the risk of violating the deadlines. We introduce formulations that can be used to solve the problems with multiple capacitated vehicles and propose algorithms based on a branch-and-cut framework. The experiments show that these approaches provide substantial improvements in computational efficiency compared to the approaches in the literature. For the stochastic approach, instances with a very large number of scenarios can be solved efficiently. Finally, we provide a computational comparison to evaluate the solution quality of the stochastic and robust VRP-Ds. The results show that the robust VRP-D provides competitive results compared to those obtained by the stochastic VRP-D, while the robust VRP-D is much less sensitive to the distributional uncertainty.

Note : Yossiri Adulyasak est présentement stagiaire postdoctoral au MIT, dans le cadre de l'entente Singapore-MIT Alliance for Research and Technology (SMART). Il a obtenu son doctorat à HEC Montréal, sous la supervision des professeurs Jean-François Cordeau et Raf Jans. / Yossiri Adulyasak is a Postdoctoral Fellow at MIT, within the SMART program. He has done his Ph.D. at HEC Montréal, under the supervision of professors Jean-François Cordeau and Raj Jans.

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VENDREDI / FRIDAY

11 octobre 2013 /
October 11th, 2013
10h30

Salle / Room 5441
Pavillon André-Aisenstadt
Université de Montréal

Ouvert à tous / Open to all

Organisateur / Organizer
Jean-François Cordeau