



SÉMINAIRE CONJOINT / JOINT SEMINAR

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**«INCREASING NODAL CAPACITY BY REDESIGNING THE TRAIN TIMETABLE:
A CASE STUDY ON THE UK'S RAIL NETWORK»**

Résumé / Abstract

Railway capacity is an increasingly scarce and valuable commodity, considering that capacity constraints at nodes (i.e. junctions and stations) tend to form the bottlenecks which limit the capacity of the overall railway network. This talk is on an EPSRC funded project, which investigates various methods for increasing nodal capacity without major investments in infrastructure enhancements for a major line of the UK's railway network. Towards this end, the project entails the application of operations research methods to the scheduling of trains through junctions and stations, with the objective of minimising nodal capacity utilisation, and thus maximising reliability and potentially releasing capacity for additional services. The first stage focuses on increasing the nodal capacity of a single node. The latter has been modelled as a shop scheduling problem and an efficient tailor-made local search method has been developed to tackle it. Optimising the capacity utilization on a single junction or station, however beneficial in itself, does not guarantee an overall optimal outcome. For the second stage of the project, the goal is therefore to extend the application of the scheduling techniques to multiple, adjacent nodes, such that to ensure that maximising the throughput of one node does not cause problems elsewhere in the network. To integrate across multiple nodes a similar to the multi-commodity network design model is proposed and an evolutionary algorithm that operates on a time-space representation has been developed to address the incumbent problem. Initial computational results on the case study will be presented, while computational results on well-known benchmarks of literature will be shown as well.

Note : Dr. Dimitris Paraskevopoulos holds a diploma in Chemical Engineering from the National Technical University of Athens, an MBA and a PhD in Operations Research from the Athens University of Economics and Business, Greece. He is currently an interdepartmental post-doctoral researcher in the School of Mathematics/School of Management, at the University of Southampton, UK. His research interests apply on the areas of Analytics and Optimization for Project and Production Scheduling and Transportation and Distribution Logistics. He has been involved in various national and EU funded research projects, while his research has been published in well-known international journals and presented in international conferences.

JEUDI / THURSDAY

**19 avril 2012 /
April 19th, 2012**

10h30

**Salle / Room 5441
Pavillon André-Aisenstadt
Université de Montréal**

Bienvenue à tous / Welcome to all

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