



## 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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## Dynamic and Stochastic Inventory-Routing

### Résumé / Abstract

The combination of inventory management and vehicle routing decisions yields a difficult combinatorial optimization problem called the Inventory-Routing Problem (IRP). This problem arises when both types of decisions must be taken jointly, which is the case in vendor-managed inventory systems. The IRP has received significant attention in recent years. Several heuristic and exact algorithms are available for its static and deterministic versions. In the dynamic version of the IRP, customer demands are gradually revealed over time and planning must be made at the beginning of each of several periods. In this context, one can sometimes take advantage of stochastic information on demand through the use of forecasts, for example. In this talk we will present different policies to handle the dynamic and stochastic version of the IRP based on heuristically solving smaller problems in a rolling horizon fashion. We will show an extensive computational analysis on randomly generated instances in order to compare several solution policies. Amongst other conclusions we show that it is possible to take advantage of stochastic information to generate better solutions albeit at the expense of more computing time. We will also show that the use of a longer rolling horizon step does not help improve solutions. Inventory holding costs have a positive correlation with solution cost. Our experiments also demonstrate that higher safety stocks lower the solution costs since customers are covered against demand variations and require fewer visits. Finally, we show that ensuring consistent solutions over time increases the cost of the solutions much more under a dynamic environment than in a static setting.

Note: Leandro C. Coelho is a Ph.D. student at HEC Montréal under the direction of Professors Jean-François Cordeau and Gilbert Laporte.

### DATE MODIFIÉE / MODIFIED DATE

**Mercredi / Wednesday**

**5 septembre 2012 /**

**September 5, 2012**

**10h30**

**Salle/Room 5441**

**Pavillon André-Aisenstadt**

**Université de Montréal**

**Bienvenue à tous / Welcome to all**

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