



# Séminaire du CIRRELT

**Gabriel Homs**

Étudiant au doctorat, Université de Montréal



## *A hybrid metaheuristic for Industrial and Tramp Ship Routing problems*

### Abstract:

In this work, we focus on a rich class of industrial and tramp ship routing problems which extends the pickup and delivery problem with time windows. The new attributes are a heterogeneous fleet, ship-cargo compatibility constraints, different ship starting points and times, and selection of services. Together, these characteristics pose considerable challenges for exact and heuristic methods, and some cases with as few as 18 cargoes remain unsolved.

To solve these problems, we propose a sophisticated extension of the unified hybrid genetic search (Vidal et al. (2014)). The new metaheuristic exploits a set-partitioning phase and uses problem-tailored variation operators to efficiently handle all the problem characteristics. As shown in our experimental analyses, our metaheuristic outperforms previous results and produces near-optimal solutions within minutes.

Finally, we consider a problem extension where the ship speed is a decision variable, and fuel consumption is a convex function of speed. We use an efficient monotonic decomposition algorithm (MDA) to optimize the ship speed on each sailing leg and discuss different strategies to integrate the MDA in our metaheuristic.

### Biography:

Gabriel Homs has a Masters in Computer Science from the Pontifical Catholic University of Rio de Janeiro and is currently a Ph.D. Student in the University of Montreal. He has experience in the development of metaheuristics for routing problems, with a focus on maritime transportation problems.

Mardi  
13 novembre 2018  
10h00

Local 1609  
Pavillon Palasis-Prince  
Université Laval

Ouvert à tous  
Le séminaire sera en anglais

Organisateur:  
*Jean-François Côté*

