CIRRELT

Séminaire du CIRRELT Seminar

Florian Arnold

Universiteit Antwerpen
Department of Applied Economics

WHAT MAKES A SOLUTION GOOD? THE GENERATION OF PROBLEM-SPECIFIC KNOWLEDGE FOR HEURISTICS

Abstract: Heuristics are the weapon of choice when it comes to solving complex combinatorial optimization problems. Even though some research focuses on tuning a heuristic with respect to a certain problem, little research has been done to investigate structural characteristics of the problem itself. In this work we argue that knowledge about a problem is highly valuable when it comes to designing efficient heuristics, and we show how it can be generated.

With knowledge we hereby mean that we can define desirable structural characteristics of good solutions. Our knowledge generation approach is based on data mining and we demonstrate its concept with the help of the most prominent combinatorial problem in Operations Research, the Vehicle Routing Problem. We define metrics to measure a solution and an instance, and generate and classify 192.000 solutions for various instances. With these metrics we are able to distinguish between optimal and non-optimal solutions with an accuracy of up to 93%.

Furthermore, we reveal the most distinguishing characteristics of good VRP solutions, and use them to build one of the most efficient heuristics in literature for the VRP.

MARDI / TUESDAY

22 août 2017 / August 22, 2017
10h30

Salle / Room 5441
Pavillon André-Aisenstadt
Université de Montréal

Ouvert à tous / Open to all

Organisateur / Organizer
Michel Gendreau

UNIVERSITÉ LAVAL · McGill · Concordia UNIVERSITY · ÉTS Le génie pour l'industrie · UQÀM · HEC MONTRÉAL · POLYTECHNIQUE MONTRÉAL · Université de Montréal