SEMINÁRIO DE INVESTIGAÇÃO OPERACIONAL

Dia 25 de Novembro (sexta-feira), às 17H00, na sala 6.4.30

Polyhedral Results and a Branch-and-Cut Algorithm for the Double Traveling Salesman Problem with Multiple Stacks

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Abstract:

In the double TSP with multiple stacks, one performs a Hamiltonian circuit to pick up n items, storing them in a vehicle with s stacks of finite capacity q satisfying last-in-first-out constraints, and then delivers every item to a corresponding customer by performing a Hamiltonian circuit.

For this problem we introduce an integer linear programming formulation with arc and precedence variables. We prove that a polytope arising from a relaxation of our formulation inherits all the facets of a polytope describing the Asymmetric TSP.

We also explain how the underlying polytope of our formulation relates to a specific set covering polytope. These theoretical results let us obtain strengthening inequalities for our formulation.

Such inequalities are embedded into a branch-and-cut algorithm for the double TSP with two stacks, outperforming the existing exact methods to tackle this version of the problem and solving instances that were previously unsolved.

This is a joint work with Roland Grappe, Mathieu Lacroix et Roberto Wolfler Calvo.

Local: Departamento de Estatística e Investigação Operacional , C6 - Piso 4, 6.4.30