# Séminaire du CIRRELT

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## SOME VARIANTS OF THE KNAPSACK PROBLEM

**Abstract:** The Knapsack Problem (KP) is one of the most studied and well-known problem in Operational Research (OR), probably partly because of its simple formulation. Although this problem may seem simple at first sight, it is involved in many applications, sometimes as a subproblem. Several generalizations and extensions of the KP have been proposed in the literature, mainly by changing the objective function and / or adding other types of constraints. All these extensions are known as NP-hard problems, and some of them remain real challenges for classical approaches in the OR field. In this talk, we deal with some variants of the KP, and we discuss on efficient approaches recently proposed to solve it. We consider mathematical models and decomposition methods, relaxation-based techniques, heuristics and metaheuristics. We focus in particular on hybrid methods combining exact and heuristic approaches. Beyond the results obtained by the different approaches we also try to identify the best techniques for solving variants of the Knapsack Problem.

**Biography:** Saïd Hanafi holds a Full Professor position in Computing Science at Institute of Techniques and Sciences, University of Valenciennes and is currently head of computer science department of LAMIH UMR CNRS 8201 (Laboratory of Industrial and Human Automation control, Mechanical engineering and Computer Science). His research lies in the design of effective heuristic and metaheuristic algorithms for solving large-scale combinatorial search problems. His is interested in theoretical as well as algorithmic modelling and application aspects of integer programming and combinatorial optimization and has published over 60 articles on the topic. His current interests revolve around the integration of tools from hybrid methods mixing exact and heuristics for solving hard problems.

VENDREDI

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11 h 00

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Ouvert à tous

**Café et viennoiseries**

**Organisateur:**
*Yan Cimon*