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Special Issue of

Computers & Operations Research

Hybrid Metaheuristics

Optimization problems are of great importance for the industrial as well as the scientific world. Algorithms to tackle optimization problems include classical techniques such as dynamic programming or branch & bound (in the case of combinatorial optimization), or gradient-based methods (in the case of numerical optimization), but also more recent techniques such as metaheuristics. Metaheuristics are iterative methods that are applied with the aim of finding a solution meeting the customer/user requirements in a reasonable amount of computation time. In contrast to many classical methods, metaheuristics do not build a model of the tackled optimization problem, but treat the problem as it is (black-box optimization). Therefore, they are directly applicable to complex real-world problems with relatively few modifications. Examples of metaheuristics are simulated annealing, tabu search, evolutionary computation, iterated local search, variable neighborhood search, and ant colony optimization.

In recent years it has become evident that the concentration on a sole metaheuristic is rather restrictive. A skilled combination of a metaheuristic with other optimization techniques, a so called hybrid metaheuristic, can provide a more efficient behavior and a higher flexibility when dealing with real-world and large-scale problems. This can be achieved by combining the complementary strengths of metaheuristics on one side with the strengths of, for example, more classical optimization techniques on the other side. In general, hybrid metaheuristic approaches can be classified as either "collaborative combinations" or "integrative combinations". Collaborative combinations are based on the exchange of information between a metaheuristic and another optimization technique running sequentially (or in parallel). Integrative combinations utilize another optimization technique (as for example dynamic programming) as a sub-ordinate part of a metaheuristic.

For the above mentioned reasons, hybrid metaheuristics currently enjoy an increasing interest in the optimization community. This is documented by the recent appearance of conferences and workshops such as CP-AI-OR (International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems) or HM (Hybrid Metaheuristics). However, the field of hybrid metaheuristics is still in its early days. Many approaches are pre-mature and a substantial amount of further research is necessary in order to develop clearly structured hybrid metaheuristics that can be generally used for optimization. This special issue is dedicated to present recent interesting work in that line.

Authors should submit their paper via EES <http://www.ees.elsevier.com/cor> and select "Special Issue: Hybrid Metaheuristics" when asked to indicate the "Article Type" in the submission process.

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Special Issue Editor:

*Dr. Christian Blum, ALBCOM Research Group, Universitat Politècnica de Catalunya, Jordi Girona 1-3, Omega 112 Campus Nord, 08034 Barcelona,
Email: cblum@lsi.upc.edu*

Important Dates:

Manuscript submission to begin: October 15, 2007
Manuscript submission deadline: February 29, 2008
Due date first review round: May 1, 2008
Final paper acceptance decision: August 31, 2008

