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Hybrid Metaheuristics

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Proceedings

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Preface

The International Workshop on Hybrid Metaheuristics is now an established event and reaches its fourth edition with HM 2007. One of the main motivations for initiating it was the need for a forum to discuss specific aspects of hybridization of metaheuristics. Hybrid metaheuristics design, development and testing require a combination of skills and a sound methodology. In particular, comparisons among hybrid techniques and assessment of their performance have to be supported by a sound experimental methodology, and one of the mainstream issues of the workshop is to promote agreed standard experimental methodologies. These motivations are still among the driving forces behind the workshop and, in these four years, we have observed an increasing attention to methodological aspects, from both the empirical and theoretical sides. The papers selected for presentation at HM 2007 are indeed a representative sample of research in the field of hybrid metaheuristics. They range from methodological to application papers. Moreover, some of them put special emphasis on the experimental analysis and statistical assessment of results.

Among the publications in this selection, there are some that focus on the integration of metaheuristics with mathematical programming, constraint satisfaction or machine learning techniques. This interdisciplinary subject is now widely recognized as one of the most effective approaches for tackling hard problems, and there is still room for new results. To achieve them, the community needs to be open toward other research communities dealing with problem solving, such as those belonging to artificial intelligence (AI) and operations research (OR).

We also note that the use of software libraries for implementing metaheuristics is increasing, even though we have to observe that the users of a software library are usually its developers, thus reducing the advantages in terms of software design and development. We believe that this situation is going to change in favor of a scenario in which some libraries will be used by most metaheuristic developers.

Finally, there are also some works describing applications of metaheuristics in continuous optimization. The cross-fertilization between combinatorial and continuous optimization is extremely important, especially because many real-world problems can be naturally modeled as mixtures of discrete and continuous components.

It is already a tradition of the workshop to keep the acceptance rate of papers relatively low: this makes it possible to publish official proceedings, which can be taken as one of the main references in the field. Besides this, special care is taken with respect to the reviewing process, during which the authors are provided with constructive and detailed reviews. For this reason, the role of the Program Committee members is crucial, and we are very grateful to them for the

effort they made examining the papers and providing detailed reviews. Among the 37 submissions received, 14 papers have been selected on the basis of the Program Committee members' suggestions. We are further grateful to Catherine C. McGeoch and Thomas Stützle, who both accepted our invitation to give an overview talk.

Looking back to the previous editions of the workshop, we observe a positive trend concerning experimental methodology. Moreover, some topics, such as the integration of metaheuristics with OR and AI techniques, have become established themes. We believe that a grounded discipline in hybrid metaheuristics could bring advantages in problem solving in many areas, such as constrained optimization, mixed integer optimization and also stochastic and online problems, which are probably one of the new frontiers still to be fully explored.

August 2007

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