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Evolutionary Computation in Combinatorial Optimization

12th European Conference, EvoCOP 2012
Málaga, Spain, April 11-13, 2012
Proceedings

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Preface

Metaheuristics continue to demonstrate their effectiveness for an ever-broadening range of difficult combinatorial optimization problems appearing in a wide variety of industrial, economic, and scientific domains. Prominent examples of metaheuristics are evolutionary algorithms, tabu search, simulated annealing, scatter search, memetic algorithms, variable neighborhood search, iterated local search, greedy randomized adaptive search procedures, ant colony optimization and estimation of distribution algorithms. Problems solved successfully include scheduling, timetabling, network design, transportation and distribution, vehicle routing, the travelling salesman problem, packing and cutting, satisfiability and general mixed integer programming.

EvoCOP began in 2001 and has been held annually since then. It is the first event specifically dedicated to the application of evolutionary computation and related methods to combinatorial optimization problems. Originally held as a workshop, EvoCOP became a conference in 2004. The events gave researchers an excellent opportunity to present their latest research and to discuss current developments and applications. Following the general trend of hybrid metaheuristics and diminishing boundaries between the different classes of metaheuristics, EvoCOP has broadened its scope in recent years and invited submissions on any kind of metaheuristic for combinatorial optimization.

This volume contains the proceedings of EvoCOP 2012, the 12th European Conference on Evolutionary Computation in Combinatorial Optimization. It was held in Málaga, Spain, during April 11–13, 2012, jointly with EuroGP 2012, the 15th European Conference on Genetic Programming, EvoBIO 2012, the 10th European Conference on Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics, EvoMUSART, the First International Conference and the 10th European Event on Evolutionary and Biologically Inspired Music, Sound, Art and Design, and EvoApplications 2012 (formerly EvoWorkshops), which consisted of the following 11 individual tracks: 9th European event on the Application of Nature-Inspired Techniques for Telecommunication Networks and Other Parallel and Distributed Systems (EvoCOMNET), Third European event on Evolutionary Algorithms and Complex Systems (EvoCOMPLEX), 6th European event on Evolutionary and Natural Computation in Finance and Economics (EvoFIN), 4th European event on Bio-inspired Algorithms in Games (EvoGAMES), 7th European event on Bio-inspired Heuristics for Design Automation (EvoHOT), 14th European event on Evolutionary Computation in Image Analysis and Signal Processing (EvoIASP), 5th European event on Bio-inspired Algorithms for Continuous Parameter Optimization (EvoNUM), First European event on Parallel Implementation of Evolutionary Algorithms (EvoPAR), First European event on Computational Intelligence for Risk Management, Security and Defence Applications (EvoRISK), 7th European event

on Nature-Inspired Techniques in Scheduling, Planning and Timetabling (EvoSTIM), and 9th European event on Evolutionary Algorithms in Stochastic and Dynamic Environments (EvoSTOC). Since 2007, all these events are grouped under the collective name EvoStar, and constitute Europe's premier co-located meetings on evolutionary computation.

Accepted papers of previous EvoCOP editions were published by Springer in the series *Lecture Notes in Computer Science* (LNCS – Volumes 2037, 2279, 2611, 3004, 3448, 3906, 4446, 4972, 5482, 6022, 6622). Below we report statistics for each conference:

EvoCOP	Submitted	Accepted	Acceptance ratio
2001	31	23	74.2%
2002	32	18	56.3%
2003	39	19	48.7%
2004	86	23	26.7%
2005	66	24	36.4%
2006	77	24	31.2%
2007	81	21	25.9%
2008	69	24	34.8%
2009	53	21	39.6%
2010	69	24	34.8%
2011	42	22	52.4%
2012	48	22	45.8%

The rigorous, double-blind reviewing process of EvoCOP 2012 resulted in the selection of 22 out of 48 submitted papers; the acceptance rate was 45.8%. The number of submissions was higher compared to the previous event. Each paper was reviewed by at least three members of the international Program Committee. All accepted papers were presented orally at the conference and are included in this proceedings volume. We would like to acknowledge the members of our Program Committee and external reviewers: we are very grateful for their thorough work. We also thank all the authors for submitting their work to this EvoCOP edition. EvoCOP 2012 contributions consist of novel algorithms together with important new insights into how well these algorithms can solve prominent test problems from the literature or real-world problems.

The success of the conference resulted from the input of many people to whom we would like to express our appreciation. First of all, we like to thank the local Chair of EvoStar 2012, Carlos Cotta from the University of Málaga. He and his team did an extraordinary job for which we are very grateful. We thank Marc Schoenauer from INRIA in France for his support with the MyReview conference management system. We thank Penousal Machado of the University of Coimbra for an excellent web site and publicity material. Thanks are also due to Jennifer Willies and the Institute for Informatics and Digital Innovation at Napier University in Edinburgh, UK, for administrative support and event coordination. We gratefully acknowledge the University of Málaga for its support of EvoStar, and in particular the School of Computer Science and the School of

Telecommunications and their respective directors, José M. Troya and Antonio Puerta. We also thank the Málaga Convention Bureau.

Last, but not least, we would like to thank Carlos Cotta, Peter Cowling, Jens Gottlieb, Jano van Hemert, Peter Merz, and Günther Raidl for their hard work and dedication in past editions of EvoCOP, which contributed to making this conference one of the reference events in evolutionary computation and metaheuristics.

April 2012

Jin-Kao Hao
Martin Middendorf

Organization

EvoCOP 2012 was organized jointly with EuroGP 2012, EvoBIO 2012, EvoMUSART 2012, and EvoApplications 2012.

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