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Francisco Chicano · Bin Hu  
Pablo García-Sánchez (Eds.)

# Evolutionary Computation in Combinatorial Optimization

16th European Conference, EvoCOP 2016  
Porto, Portugal, March 30 – April 1, 2016  
Proceedings

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# Preface

Combinatorial optimization is the discipline of decision-making dealing with discrete alternatives. The field is at the interface between discrete mathematics, computing science, operational research, and recently also machine learning, and it includes a diversity of algorithms and hybrid methods. Stochastic local search (metaheuristics), evolutionary, and other nature-inspired algorithms are a family of methods able to provide robust, high-quality solutions to problems of a realistic size in reasonable time. These methods are also relatively simple to design and implement, and offer high flexibility. Many challenging applications in science, industry, and commerce can be formulated as optimization problems. A growing number of them have been successfully solved using the sort of computational methods mentioned, which are the main content of these proceedings.

EvoCOP was held for the first time in 2001, as the first workshop specifically devoted to evolutionary computation in combinatorial optimization. In 2004 it became a conference, and since then it has run annually. This volume contains the proceedings of EvoCOP 2016, the 16th European Conference on Evolutionary Computation in Combinatorial Optimization, which was held in Porto, Portugal, from 30 March to 1 April 2016. EvoCOP is one of the four events of Evostar 2016. The other three are EuroGP (19th European Conference on Genetic Programming), EvoMUSART (5th International Conference on Evolutionary and Biologically Inspired Music, Sound, Art and Design), and EvoApplications (19th European Conference on the Applications of Evolutionary Computation, formerly known as EvoWorkshops).

Previous EvoCOP proceedings 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, 7245, 7832, 8600, 9026). The table on the next page reports the statistics for each conference.

This year, 17 out of 44 papers were accepted after our rigorous double-blind process, resulting in a 38.6 % acceptance rate. We would like to thank the quality and timeliness of our Program Committee members' work, especially since this year's time frame was tighter than usual. Decisions considered both the reviewers, report and evaluation of the program chairs. The 17 accepted papers covered methodology, applications, and theoretical studies. The methods included evolutionary and memetic algorithms, variable neighborhood search, particle swarm optimization, hyperheuristics, matheuristics, and other adaptive approaches. Applications included both traditional domains, such as graph coloring, vehicle routing, the longest common subsequence problem, the quadratic assignment problem, and new(er) domains such as the traveling thief problem, Web service location, and finding short addition chains. The theoretical studies involved fitness landscape analysis, local search and recombination operator analysis, and the big valley search space hypothesis. The consideration of multiple objectives, dynamic, and

EvoCOP	Submitted	Accepted	Acceptance (%)
2016	44	17	38.6
2015	46	19	41.3
2014	42	20	47.6
2013	50	23	46.0
2012	48	22	45.8
2011	42	22	52.4
2010	69	24	34.8
2009	53	21	39.6
2008	69	24	34.8
2007	81	21	25.9
2006	77	24	31.2
2005	66	24	36.4
2004	86	23	26.7
2003	39	19	48.7
2002	32	18	56.3
2001	31	23	74.2

noisy environments was also present in a number of articles. This makes the EvoCOP proceedings an important source for current research trends in combinatorial optimization.

We would like to express our appreciation to the various persons and institutions making this a successful event. First, we thank the local organization team led by Penousal Machado and Ernesto Costa from the University of Coimbra. We extend our acknowledgments to Pablo García-Sánchez from the University of Granada for the excellent website and publicity material. We thank Marc Schoenauer from Inria Paris for his continued assistance in providing MyReview conference management system. Thanks are also due to Jennifer Willies and the Institute for Informatics and Digital Innovation at Edinburgh Napier University, UK, for administrative support and event coordination. Finally, we want to thank the Câmara Municipal do Porto and Turismo do Porto for their support, and the prominent keynote speakers, Richard Forsyth and Kenneth Sorensen.

Special thanks also to Christian Blum, Carlos Cotta, Peter Cowling, Jens Gottlieb, Jin-Kao Hao, Jano van Hemert, Peter Merz, Martin Middendorf, Gabriela Ochoa, and Günther R. Raidl for their hard work and dedication at past editions of EvoCOP, making this one of the reference international events in evolutionary computation and metaheuristics.

March 2016

Francisco Chicano  
Bin Hu  
Pablo García-Sánchez

# Organization

EvoCOP 2016 was organized jointly with EuroGP 2016, EvoMUSART 2016, and EvoApplications 2016.

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