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Evolutionary Computation in Combinatorial Optimization

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Preface

Combinatorial optimization is concerned with finding the optimal solution of problems with discrete variables. The field originates from applied mathematics and computer science, but it has seen contributions from operational research, decision-making, artificial intelligence, and machine learning. It is key to tackling diverse problems in science, industry, and business applications. These problems usually cannot be solved by exact methods within a reasonable time limit, and instead require the use of heuristic methods to provide high-quality or low-cost solutions in as short a time as possible. Heuristic methods include not only problem-specific heuristics, but most prominently metaheuristics, which are general-purpose methods that are relatively simple to apply to new problems. Among the earliest and most successful metaheuristics are evolutionary algorithms, originally inspired by the evolution of species by natural selection, together with various other stochastic local search methods, such as simulated annealing. More recent methods include ant colony optimization, inspired by the foraging behavior of some species of ants, and hybrid methods, such as matheuristics that combine exact and heuristic methods. The successful application of these methods to real-world combinatorial optimization problems is one of the main topics of these proceedings.

This volume contains the proceedings of EvoCOP 2017, the 17th European Conference on Evolutionary Computation in Combinatorial Optimization, that was held in Amsterdam, The Netherlands, during April 19–21, 2017. EvoCOP was held in 2001 as the first workshop specifically devoted to evolutionary computation in combinatorial optimization. It became an annual conference in 2004. EvoCOP is one of the four events of Evostar 2017. The other three are EuroGP (20th European Conference on Genetic Programming), EvoMUSART (6th International Conference on Evolutionary and Biologically Inspired Music, Sound, Art and Design), and EvoApplications (20th 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, 9595). The table on the next page reports the statistics for each conference.

This year, 16 out of 39 papers were accepted after a rigorous double-blind process, resulting in a 41% acceptance rate. We would like to thank the quality and timeliness of our Program Committee members' work, especially since the reviewing period coincided with the Christmas holidays. Decisions considered both the reviewers' report and the evaluation of the program chairs. The 16 papers accepted cover both empirical and theoretical studies on a wide range of academic and real-world applications. The methods include evolutionary and memetic algorithms, large neighborhood search, estimation of distribution algorithms, beam search, ant colony optimization, hyper-heuristics, and matheuristics. Applications include both traditional domains, such

EvoCOP	LNCS vol.	Submitted	Accepted	Acceptance (%)
2017	10197	39	16	41.0
2016	9595	44	17	38.6
2015	9026	46	19	41.3
2014	8600	42	20	47.6
2013	7832	50	23	46.0
2012	7245	48	22	45.8
2011	6622	42	22	52.4
2010	6022	69	24	34.8
2009	5482	53	21	39.6
2008	4972	69	24	34.8
2007	4446	81	21	25.9
2006	3906	77	24	31.2
2005	3448	66	24	36.4
2004	3004	86	23	26.7
2003	2611	39	19	48.7
2002	2279	32	18	56.3
2001	2037	31	23	74.2

as the knapsack problem, vehicle routing, scheduling problems and SAT; and newer domains such as the traveling thief problem, location planning for car-sharing systems, and spacecraft trajectory optimization. Papers also study important concepts such as pseudo-backbones, phase transitions in local optima networks, and the analysis of operators. This wide range of topics 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 Evert Haasdijk and Jacqueline Heinerman from the Vrije University Amsterdam. We thank Marc Schoenauer from Inria Saclay for his continued assistance in providing the MyReview conference management system and Pablo García Sánchez from the University of Cádiz for EvoStar publicity and website. Thanks are also due to SPECIES (Society for the Promotion of Evolutionary Computation in Europe and its Surroundings); in particular, Marc Schoenauer (President), Anna I Esparcia-Alcázar (Secretary and Vice-President), Wolfgang Banzhaf (Treasurer), and Jennifer Willies (EvoStar coordinator). Finally, we wish to thank the keynote speakers, Kenneth De Jong and Arthur Kordon.

Special thanks also to Christian Blum, Francisco Chicano, 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.

February 2017

Bin Hu
Manuel López-Ibáñez

Organization

EvoCOP 2017 was organized jointly with EuroGP 2017, EvoMUSART 2017, and EvoApplications 2017.

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Contents