Preface

Evolutionary Computation (EC) involves the study of problem solving and optimization techniques inspired by principles of natural evolution and genetics. EC has been able to draw the attention of an increasing number of researchers and practitioners in several fields. Evolutionary algorithms have in particular been shown to be effective for difficult combinatorial optimization problems appearing in various industrial, economic, and scientific domains.

This volume contains the proceedings of EvoCOP 2004, the 4th European Conference on Evolutionary Computation in Combinatorial Optimization. It was held in Coimbra, Portugal, on April 5–7, 2004, jointly with EuroGP 2004, the 7th European Conference on Genetic Programming, and EvoWorkshops 2004, which consisted of the following six individual workshops: EvoBIO, the 2nd European Workshop on Evolutionary Bioinformatics; EvoCOMNET, the 1st European Workshop on Evolutionary Computation in Communications, Networks, and Connected Systems; EvoHOT, the 1st European Workshop on Hardware Optimisation; EvoIASP, the 6th European Workshop on Evolutionary Computation in Image Analysis and Signal Processing; EvoMUSART, the 2nd European Workshop on Evolutionary Music and Art; and EvoSTOC, the 1st European Workshop on Evolutionary Algorithms in Stochastic and Dynamic Environments.

EvoNet, the European Network of Excellence in Evolutionary Computing, organized its first events in 1998 as a collection of workshops that dealt with both theoretical and application-oriented aspects of EC. EuroGP, one of these workshops, soon became the main European conference dedicated to Genetic Programming. EvoCOP, held annually as a workshop since 2001, followed EuroGP. Due to its continuous growth in the past, EvoCOP became a conference in 2004, and it is now the premier European event focusing on evolutionary computation in combinatorial optimization. The events gave researchers and practitioners an excellent opportunity to present their latest research and to discuss current developments and applications, besides stimulating closer future interaction between members of this scientific community. Accepted papers of previous EvoCOP events were also published by Springer in the series Lecture Notes in Computer Science (LNCS Volumes 2037, 2279, and 2611).

EvoCOP 2004 covers evolutionary algorithms as well as related metaheuristics like memetic algorithms, ant colony optimization, and scatter search. The papers deal with representations, operators, search spaces, adaptation, comparison of algorithms, hybridization of different methods, and theory. The list of studied combinatorial optimization problems includes on the one hand classical academic problems such as graph coloring, network design, cutting, packing, scheduling, timetabling, the traveling salesperson problem, and vehicle routing, and on the other hand specific real-world applications.

The success of EvoCOP, so far the only international series of events specifi-
cally dedicated to the application of evolutionary computation and related meth-
ods to combinatorial optimization problems, is documented by a steadily growing
number of submissions; see the table below. EvoCOP 2004 is the largest event of
its series. A double-blind reviewing process made a strong selection among the
submitted papers, resulting in an acceptance rate of 26.7%. All accepted papers
were presented orally at the conference and are included in this proceedings vol-
ume. We would like to give credit to the members of the program committee, to
whom we are very grateful for their quick and thorough work.

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%

EvoCOP 2004 was sponsored, for the last time, by EvoNet, whose activity
as an EU-funded project has come to an end with the organization of this year's
events. However, the figures reported above show that EvoCOP, as well as Eu-
roGP and the EvoWorkshops, have reached a degree of maturity and scientific
prestige that will allow the activity promoted by EvoNet during the last six years
to go on, and presumably further expand in the years to come.

The organization of the event was made possible thanks to the active partic-
ipation of several members of EvoNet. In particular, we want to thank Jennifer
Willies, EvoNet's administrator, for her tremendous efforts.

April 2004   Jens Gottlieb
                                                                Günther R. Raidl

Organization

EvoCOP 2004 was organized jointly with EuroGP 2004 and the EvoWorkshops 2004.

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