

# Preface

Evolutionary Computation (EC) is a rapidly expanding field of computer science which creates, studies and applies problem solving, optimisation and machine-learning techniques inspired by the theories of genetic inheritance and natural selection. Although the origins of this field can be traced back to the inventors of the computer, Turing and von Neumann, it was only properly founded in the 1960s by people such as Holland, Rechenberg and Fogel, and only became widely known and worked on in the late 1980s.

During this time a number of results were reported in the literature which showed how EC techniques can solve problems in domains such as automatic design, optimisation, pattern recognition and control. Until recently, however, only very rarely could one claim that EC techniques approached the performance of human experts in these domains.

Thanks to the technological improvements as a result of empirical work in EC, advances in EC theory, and the increased power of the computer, EC is now ready for large scale applications in complex engineering domains, such as image analysis, signal processing and telecommunications.

This volume contains the proceedings of EvoIASP'99, the first European Workshop on Evolutionary Computation in Image Analysis and Signal Processing, and of EuroECTel'99, the first European Workshop on Evolutionary Telecommunications, held, respectively, on 28 and 29 May 1999, in Göteborg, Sweden.

EvoIASP'99 was the first event specifically devoted to the application of EC to image analysis and signal processing. The aims of the workshop were, firstly, to give European and non-European researchers in these fields, as well as people from industry, an opportunity to present their latest research and discuss current developments and applications, and, secondly, to foster closer future interaction between members of the three scientific communities involved.

EuroECTel'99 was the first international meeting specifically oriented towards work on the application of EC to the variety of optimisation problems which exist in the field of telecommunications. Some of the very latest work on this topic was presented and discussed at this workshop, including new methods for network optimisation, issues of optimisation in distributed databases, and new EC-based methods for verifying communications protocols.

The workshops were held in conjunction with two other major European events: EvoRobot'99, the second European Workshop on Evolutionary Robotics, held on May 28 and 29, and EuroGP'99, the second European Workshop on Genetic Programming, held on May 26 and 27.

Thirteen papers were accepted for publication in the EvoIASP'99 proceedings and for presentation at the workshop while five papers were accepted for publication in the EuroECTel'99 proceedings and for presentation at the workshop. Many of these papers are written by researchers internationally recognised

in their respective fields and all are of high quality. This has been assured by two international program committees which include the best EC researchers from around the world, as well as experts in image analysis, signal processing, and telecommunications.

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Riccardo Poli, Hans-Michael Voigt, Stefano Cagnoni,  
David Corne, George Smith, and Terence C. Fogarty

# Organization

EvoIASP'99: the first European Workshop on Evolutionary Image Analysis and Signal Processing was organized by EvoIASP, the EvoNet Working Group on Image Analysis and Signal Processing

EuroECTel'99: the first European Workshop on Evolutionary Telecommunications was organized by ECTelNet, the EvoNet Working Group on Telecommunications

## EvoIASP'99 Organizing Committee

Program co-chair: Riccardo Poli (University of Birmingham, UK)  
Program co-chair: Hans-Michael Voigt (GFaI Berlin, Germany)  
Publication chair: Terence C. Fogarty (Napier University, UK)  
Publicity chair: Stefano Cagnoni (University of Parma, Italy)  
Local chair: Peter Nordin (Chalmers University of Technology, Sweden)

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Peter Nordin, Chalmers University of Technology, Sweden  
Riccardo Poli, University of Birmingham, UK  
Jim Smith, University of the West of England, UK  
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## **EuroECTel'99 Organizing Committee**

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Program co-chair: George Smith (University of East Anglia, UK)  
Program co-chair: Martin Oates (BT, UK)  
Publication chair: Terence C. Fogarty (Napier University, UK)  
Local chair: Peter Nordin (Chalmers University of Technology, Sweden)

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## **Sponsoring Institutions**

Chalmers University of Technology and Göteborg University, Sweden  
EvoNet: the Network of Excellence in Evolutionary Computing