

Preface

The field of *bio-inspired computing and modeling* has witnessed a rapid growth in the last 25 years. A relatively large and still increasing number of conferences and workshops, journals and special issues are devoted each year to different aspects related to the understanding of mechanisms in the natural world and to their reverse-engineering for the design of novel algorithms and hardware systems. Results from bio-inspired research find their successful application in a wide range of different fields, including, among others, optimization and operations research, networking, robotics, bioinformatics, and data mining.

While most conferences in the bio-inspired domain focus on a specific field of application (e.g., bio-inspired robot systems) or on specific families of bio-inspired approaches (e.g., swarm intelligence), the BIONETICS series of conferences avoid focusing on specific bio-inspired application domains or strategies, aiming instead at being truly *interdisciplinary*. BIONETICS is conceived as a general forum for researchers and practitioners from different disciplines and application fields who seek the understanding of fundamental principles and design strategies in biological systems, and leverage on this understanding to build bio-inspired systems for problem-solving and engineering applications.

The 2012 edition of BIONETICS, held in Lugano, Switzerland, during December 10–11, 2012, was the seventh in this series of conferences. The first edition was held in 2006, in Cavalese, in Italy, and was then held in Budapest, Hungary (2007), Hyogo, Japan (2008), Avignon, France (2009), Boston, MA, USA (2010), and York, UK (2011). The papers in this volume were orally presented at the conference, and represent a carefully selected sample of state-of-the-art research in the domain of bio-inspired modeling and applications. The conference featured 40 submissions, 23 of which were accepted as full papers, corresponding to a 57% acceptance rate, after a very careful blind-review process with three reviewers per paper. These submission numbers are similar to those of previous editions, showing a stable interest in the conference (apart from the 2010 edition, which had a surge of submissions), in spite of the fierce competition with the continually increasing number of conferences addressing related topics.

In line with the truly interdisciplinary philosophy of the conference, the papers included in this volume cover a wide range of topics and application domains: bio-inspired approaches for telecommunications, robotics and learning issues, modeling at the molecular scale, bioinformatics, optimization, and bio-inspired approaches to various problems such as social networking, game theory, and language analysis. Overall, these works provide a high-quality sample of the diversity in bio-inspired research, as well as its wide potential for use in real-world applications and as a tool for gaining a deeper understanding of biological and social processes.

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