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Artificial Immune Systems

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Proceedings

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Preface

The subject of artificial immune systems (AIS) is a maturing area of research that bridges the disciplines of immunology, computer science, and engineering. The scope of AIS ranges from modelling and simulation of the immune system through to immune-inspired algorithms and engineering solutions. In recent years, algorithms inspired by theoretical immunology have been applied to a wide variety of domains, including machine learning, computer security, fault tolerance, bioinformatics, data mining, optimization, and synthetic biology. Increasingly, theoretical insight into aspects of artificial and real immune systems has been sought through mathematical and computational modelling and analysis. This vigorous field of research investigates how immunology can assist our technology, and along the way is beginning to help biologists understand their unique problems.

AIS researchers are now forming their own community and identity. The International Conference on Artificial Immune Systems is proud to be the premier conference in the area. As its organizers, we were honored to have such a variety of innovative and original scientific papers presented this year.

ICARIS 2011 was the tenth international conference dedicated entirely to the field of AIS. It was held in the UK, at the prestigious University of Cambridge, during July 18–21, 2011.

With respect to the previous editions, ICARIS 2011 had some new and exciting features. For this edition we organized and managed two distinct Programme Committees: *Programme Committee for Computational Immunology and Immunoinformatics* and *Programme Committee for Immunological Computation, Immune-Inspired Engineering, Immune-Inspired Metaheuristics*, comprising 117 Programme Committee members and 12 external reviewers.

There were five plenary lectures by Arup Chakraborty, MIT, USA; Jonathan Jones, Sainsbury Laboratory, UK; Andrew Phillips, Microsoft Research Cambridge, UK; Rino Rappuoli, Novartis, Italy; and Jon Timmis, University of York, UK. Moreover, the Organizing Committee devoted several special sessions to the topic of “Immunoinformatics and Computational Immunology.” Immunoinformatics is a new discipline that aims to apply computer science techniques to molecules, cells, and organs of the immune system and to use bioinformatics and systems biology tools for a better understanding of the immune functions.

We had more submissions than ever this year, and each manuscript was independently reviewed by at least four members of the Programme Committee in a blind review process. In these proceedings there are 36 papers written by leading scientists in the field, from 38 different countries in 5 continents, describing an impressive array of ideas, technologies, algorithms, methods, and applications for AIS.

We could not have organized this conference without these researchers, so we thank them all for coming. We also could not have organized ICARIS without the excellent work of all of the Programme Committee members, stream leaders, Publicity Chairs, and Organizing Committee members.

We would like to express our appreciation to the keynote and tutorial speakers who accepted our invitation, and to all authors who submitted research papers to ICARIS 2011.

July 2011

Pietro Liò
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