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# Artificial Immune Systems

6th International Conference, ICARIS 2007  
Santos, Brazil, August 26-29, 2007  
Proceedings

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# Preface

The field of artificial immune systems (AIS) is one of the most recent natural computing approaches to emerge from engineering, computer science and theoretical immunology. The immune system is an adaptive system that employs many parallel and complementary mechanisms to maintain homeostasis and defend the organism against pathological agents. It is a distributed system, capable of constructing and maintaining a dynamical and structural identity, learning to identify previously unseen invaders and remembering what it has learnt. Numerous immune algorithms now exist, based on processes identified within the vertebrate immune system. These computational techniques have many potential applications, such as in distributed and adaptive control, machine learning, pattern recognition, fault and anomaly detection, computer security, optimization, and distributed system design.

The International Conference on Artificial Immune Systems (ICARIS) started in 2002 with the goal of bringing together a number of researchers investigating forms of using ideas from the immune system to do engineering and computing and to solve complex problems. Some theoretically oriented researchers also joined this effort with ambitious goals such as modeling the immune system. There is a continued effort to strengthen the interaction among distinct research areas, aiming at supporting the multidisciplinary outline of the field. Table 1 indicates the number of submissions versus the number of published papers for each of the six ICARIS conferences up to now. From 2004 to 2007 the number of submissions and accepted papers has varied little with a slight increase in 2005, although one would probably expect these numbers to have increased more over time, due to the existence of mature textbooks and survey papers in the literature. Despite that, the submissions this year came from 24 countries (Lithuania, Switzerland, Luxemburg, Chile, Taiwan, Japan, Malaysia, Morocco, Iran, Portugal, Belgium, Algeria, Turkey, Poland, India, Pakistan, Colombia, USA, Hong Kong, Germany, Republic of Korea, P. R. China, UK and Brazil), and the range of innovative and well-succeeded applications of immune-inspired algorithms is increasing significantly. As we are with the field almost from its inception, we noticed that ICARIS conferences are playing a great role in bringing newcomers to the field. It is a challenge for us as a community to stimulate these newcomers and encourage others, so that the field may face sustainable growth and progress.

Concerning the event organization, for us it was a great pleasure to host ICARIS in Santos/SP, Brazil. This is a particularly interesting city in Brazil, for it contains the largest port in Latin America, it is surrounded by paradisiacal beaches and dense Atlantic forests, and it is the house of one of the most traditional Brazilian soccer teams: Santos Futebol Clube, the soccer team where Pele, the most famous soccer player around the world, developed his splendid career.

**Table 1.** Number of submissions versus number of accepted papers for each ICARIS conference

| Year | Submissions | Acceptance (Rate%) |
|------|-------------|--------------------|
| 2002 | —           | 26 (—%)            |
| 2003 | 41          | 26 (63%)           |
| 2004 | 58          | 34 (59%)           |
| 2005 | 68          | 37 (54%)           |
| 2006 | 60          | 35 (58%)           |
| 2007 | 58          | 35 (60%)           |

ICARIS 2007 provided a number of activities for its attendees, from lectures, to tutorials, software demonstrations, panel discussions, and paper presentations. We had the pleasure of bringing Rob de Boer (University of Utrecht, Netherlands), Jorge Carneiro (Instituto Gulbenkian de Ciências, Portugal), Hugues Bersini (IRIDIA, Brussels), and Uwe Aickelin (University of Nottingham, UK), for the event.

The organization of ICARIS 2007 would not have been possible without the support of a number of committed institutions and people. We are particularly indebted to our home institutions and company, UniSantos, Unicamp and Nat-Comp, respectively, and to all the collaborators and sponsors that helped to make ICARIS 2007 a success.

August 2007

Leandro Nunes de Castro  
 Fernando Von Zuben  
 Helder Knidel

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ICARIS 2007 was organized by the University of Santos (UNISANTOS), State University of Campinas (UNICAMP) and NatComp - From Nature to Business.

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