Artificial Immune Systems

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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.
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
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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# Table of Contents

## Search and Optimization

A Gradient-Based Artificial Immune System Applied to Optimal Power Flow Problems .................................................. 1  
*Leonardo de Mello Honório, Armando M. Leite da Silva, and Daniele A. Barbosa*

Multimodal Dynamic Optimization: From Evolutionary Algorithms to Artificial Immune Systems ........................................ 13  
*Nikolaos Nanas and Anne De Roeck*

NAIS: A Calibrated Immune Inspired Algorithm to Solve Binary Constraint Satisfaction Problems ................................. 25  
*Marcos Zuñiga, María-Cristina Riff, and Elizabeth Montero*

A Solution Concept for Artificial Immune Networks: A Coevolutionary Perspective ...................................................... 35  
*Oscar Alonso, Fabio A. Gonzalez, Fernando Niño, and Juan Galeano*

## Classification and Clustering

Artificial Immune Systems for Classification of Petroleum Well Drilling Operations ...................................................... 47  
*Adriane B.S. Serapião, José R.P. Mendes, and Kazuo Miura*

The SUPRAIC Algorithm: A Suppression Immune Based Mechanism to Find a Representative Training Set in Data Classification Tasks ................................................................. 59  
*Graziela P. Figueredo, Nelson F.F. Ebecken, and Helio J.C. Barbosa*

The Influence of Diversity in an Immune–Based Algorithm to Train MLP Networks ...................................................... 71  
*Rodrigo Pastì and Leandro Nunes de Castro*

Applying Biclustering to Text Mining: An Immune-Inspired Approach .......................................................... 83  
*Pablo A.D. de Castro, Fabricio O. de França, Hamilton M. Ferreira, and Fernando J. Von Zuben*

## Anomaly Detection and Negative Selection

Defence Against 802.11 DoS Attacks Using Artificial Immune System .......................................................... 95  
*M. Zubair Shafiq and Muddassar Farooq*
A Novel Immune Inspired Approach to Fault Detection ............... 107
T.S. Guzella, T.A. Mota-Santos, and W.M. Caminhas

Towards a Novel Immune Inspired Approach to Temporal Anomaly Detection ................................................................. 119
T.S. Guzella, T.A. Mota-Santos, and W.M. Caminhas

Bankruptcy Prediction Using Artificial Immune Systems ................. 131
Rohit Singh and Raghu Nandan Sengupta

Phase Transition and the Computational Complexity of Generating $r$-Contiguous Detectors ................................................ 142
Thomas Stibor

Real-Valued Negative Selection Algorithm with a Quasi-Monte Carlo Genetic Detector Generation .............................................. 156
Jorge L.M. Amaral, José F.M. Amaral, and Ricardo Tanscheit

A Novel Fast Negative Selection Algorithm Enhanced by State Graphs ................................................................. 168
Wenjian Luo, Xin Wang, and Xufa Wang

Robotics, Control and Electronics

Clonal Selection Algorithms for 6-DOF PID Control of Autonomous Underwater Vehicles ....................................................... 182
Jongan Lee, Mootaek Roh, Jinsung Lee, and Doheon Lee

An Immuno Robotic System for Humanitarian Search and Rescue .... 191
Henry Y.K. Lau and Albert Ko

The Application of a Dendritic Cell Algorithm to a Robotic Classifier ................................................................. 204
Robert Oates, Julie Greensmith, Uwe Aickelin, Jonathan Garibaldi, and Graham Kendall

On Immune Inspired Homeostasis for Electronic Systems ............. 216
Nick D. Owens, Jon Timmis, Andrew J. Greensted, and Andy M. Tyrell

Modeling Papers

Modeling Migration, Compartmentalization and Exit of Naive T Cells in Lymph Nodes Without Chemotaxis .............................. 228
Johannes Textor and Jürgen Westermann

Revisiting the Central and Peripheral Immune System .................. 240
Chris McEwan, Emma Hart, and Ben Paechter
### Topological Constraints in the Evolution of Idiotypic Networks
Emma Hart, Francisco Santos, and Hugues Bersini

A Computational Model for the Cognitive Immune System Theory Based on Learning Classifier Systems
Daniel Voigt, Henry Wirth, and Werner Dilger

### Conceptual Papers

Motif Detection Inspired by Immune Memory
William Wilson, Phil Birkin, and Uwe Aickelin

An Immune-Inspired Approach to Speckled Computing
Despina Davoudani, Emma Hart, and Ben Paechter

Biological Inspiration for Artificial Immune Systems
Jamie Twycross and Uwe Aickelin

Regulatory T Cells: Inspiration for Artificial Immune Systems
T.S. Guzella, T.A. Mota-Santos, and W.M. Caminhas

### Technical Papers and General Applications

Automated Blog Design System with a Population-Based Artificial Immune Algorithm
Kiryong Ha, Inho Park, Jeonwoo Lee, and Doheon Lee

Immune and Evolutionary Approaches to Software Mutation Testing
Pete May, Jon Timmis, and Keith Mander

An Artificial Immune System Based Approach for English Grammar Checking
Akshat Kumar and Shivashankar B. Nair

A Novel Clonal Selection Algorithm Based Fragile Watermarking Method
Veysel Aslantas, Saban Ozer, and Serkan Ozturk

Nauman Mazhar and Muddassar Farooq

A Cultural Immune System for Economic Load Dispatch with Non-smooth Cost Functions
Richard A. Gonçalves, Carolina P. de Almeida, Myriam R. Delgado, Elizabeth F. Goldbarg, and Marco C. Goldbarg
Artificial Immune System to Find a Set of $k$-Spanning Trees with Low Costs and Distinct Topologies .............................................. 395
   Priscila C. Berbert, Leonardo J.R. Freitas Filho, Tiago A. Almeida,
   Márcia B. Carvalho, and Akebo Yamakami

How to Obtain Appropriate Executive Decisions Using Artificial Immunologic Systems ............................................. 407
   Bernardo Caldas, Marcelo Pita, and Fernando Buarque

An Artificial Immune System-Inspired Multiobjective Evolutionary Algorithm with Application to the Detection of Distributed Computer Network Intrusions .............................................. 420
   Charles R. Haag, Gary B. Lamont, Paul D. Williams, and
   Gilbert L. Peterson

Author Index ............................................................... 437