

# LUIS MATEUS ROCHA

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## Recent Professional Appointments:

UNIVERSITY OF INDIANA, SCHOOL OF INFORMATICS AND COGNITIVE SCIENCE PROGRAM, *Associate Professor, Since August 2004. Director of Complex Systems PhD Track.*

INSTITUTO GULBENKIAN DA CIENCIA, Portugal. Director of the *FLAD Computational Biology Collaboratorium*, and in the Direction of the PhD Program in Computational Biology 04/00-present.

LOS ALAMOS NATIONAL LABORATORY, MODELING, ALGORITHMS, AND INFORMATICS GROUP, Technical Staff: 1999-2004, Postdoctoral Associate: 1997-1999. Leader of the *Complex Systems Modeling Research Focus Area*.

STATE UNIVERSITY OF NEW YORK AT BINGHAMTON, DEPARTMENT OF SYSTEMS SCIENCE AND INDUSTRIAL ENGINEERING, Adjunct Professor, 1995-1997 and Information Systems Manager, 1995-1997

## Research Interests:

**Complex adaptive systems:** Agent-based modeling, artificial life, bio-inspired computing, cellular automata, embodied cognition, emergent computation, evolutionary and adaptive systems, network analysis, origin of information, theoretical biology

**Computational biology:** Automatic functional annotation, bioinformatics, microarray analysis, RNA editing, text and literature mining, systems biology

**Computational intelligence:** Collective and adaptive knowledge organization, connectionism, data and text mining, evolutionary computation, fuzzy set theory, generalized information theory, information retrieval, knowledge and document networks, recommender systems, search informatics, uncertainty modeling.

## Academic Education:

*PhD in Systems Science, 1997, State University of New York, Binghamton, New York.*

*Licentiate (5 year) Degree in Mechanical Engineering with specialization in Systems Engineering (1985-1990), Instituto Superior Técnico, Lisbon, Portugal.*

## Professional Service:

**Editorial and Advisory Boards (selected):** *Int. Journal of Natural Computing Research, Journal of Biosemiotics.*

**Ad Hoc Editor:** *Artificial Life, Biosystems, Communication and Cognition - Artificial Intelligence*

**Ad Hoc Reviewer (Selected):** *Adaptive Behavior, Advances in Complex Systems, Artificial Intelligence, Artificial Life, Behavioral and Brain Sciences, Biosystems, BMC Bioinformatics, Cognitive Science, Complex Systems, Data & Knowledge Engineering journal, Data Mining & Knowledge Discovery, IEEE Trans. Evolutionary Computation, IEEE Trans. on Systems Man and Cybernetics, Int. J. of Human-Computer Studies, Int. J. of General Systems, Journal of Artificial Societies and Social Simulation, Journal of Theoretical Biology, Molecular Biosystems, Nucleic Acids Research, Proc. of the Nat. Academy of Sciences (PNAS).*

## Selected Recent Conference Organizing and Program Committees

ISMB 2009: *17th Int. Conf. on Intelligent Systems for Molecular Biology*, June 27 - July 2, Stockholm, Sweden.

EPIA 2009: *14th Portuguese Conf. on Artificial Intelligence*, Aveiro, Portugal (**Program Chair**)

ISMB 2008: *16th International Conference on Intelligent Systems for Molecular Biology*, Toronto, July 17-23

AAAI-08: *The 23rd National Conference on Artificial Intelligence*, Chicago, Illinois, July 13-17, 2008.

GECCO 2008: *Genetic and Evolutionary Computation Conference*, Atlanta, Georgia, USA, July 12-16, 2008.

WI-08: *2008 IEEE World Congress on Computational Intelligence*. Hong Kong, China, June 1-6, 2008.

ECAL 2007: *European Conference on Artificial Life*, September 2007, Lisbon, Portugal (**Organizing Com.**)

JBB06: *The Joint BioLINK-BioOntologies Meeting*, in association with the *14<sup>th</sup> International Conference on Intelligent Systems for Molecular Biology (ISMB'06)*, Fortaleza, Brazil, August 4-10, 2006.

*Artificial Life X*: Bloomington, IN, June 3-7, 2006 (**Chair of Organizing Committee**)

### **Selected Review Panels**

National Science Foundation, Computer & Information Science & Engineering, 2006  
Chair of Robotics, Intelligent and Information Systems Review Panel of the Fundacao Ciencia e Tecnologia, Portugal, 2000, 2003, 2004, 2007  
Belgian Fund for Scientific Research, 2005 (Vrije Universiteit Brussels - VUB), 2004, 2005, 2006.  
Computer Science and Software Engineering internal proposal (LDRD) review committee at the Los Alamos National Laboratory 1998-2000.

### **Selected Recent Invited Lectures**

SYSTEMS BIOLOGY IN MEDICINE WORKSHOP, UNIVERSITY OF BARCELONA, HOSPITAL CLINIC, MAY 8-10, 2008.  
Invited Speaker: "Complex Networks and Bibliome Informatics: Applications to Computational Biology"  
UNIVERSITY OF CALIFORNIA AT LOS ANGELES, NOVEMBER 5-9, 2007, INST. FOR PURE & APPLIED MATHEMATICS,  
Invited Speaker: "Social Data Mining and Knowledge Building Workshop"  
EUROPEAN CONFERENCE ON ARTIFICIAL LIFE, 2007, SEPTEMBER 10-15, LISBON, PORTUGAL.  
*Invited Discussant:* "Reality is Stranger than Fiction: What to do in Artificial Life About Advances in Biology?"  
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN. Nonlinear Dynamics and Complex Systems Seminar, October 29th, 2004.  
INFORMATION SCIENCE AND TECHNOLOGY COLLOQUIUM, NASA GODDARD SPACE FLIGHT CENTER, Jan. 29, 2003  
*Featured speaker*  
CENTER FOR THE STUDY OF COMPLEX SYSTEMS, UNIVERSITY OF MICHIGAN, ANN ARBOR, December 5, 2002  
*Invited Speaker*  
CRITICAL STUDIES WORKSHOP, STANFORD UNIVERSITY, MAY 8, 2002.  
*Invited speaker.*  
GORDON RESEARCH CONFERENCE ON RNA EDITING JANUARY 21-26, 2001, VENTURA, CA.  
Invited keynote session speaker: "Simulations of RNA Editing and the Origin of Codes".

### **Selected List of Recent Publications:**

T. Simas and L.M. Rocha [2008]. "Stochastic model for scale-free networks with cut-offs". *Physical Review E*. **78**(6):066116.  
A. Abi-Haidar, J. Kaur, A. Maguitman, P. Radivojac, A. Retchsteiner, K. Verspoor, Z. Wang, and L.M. Rocha [2008]. "Uncovering protein-protein interactions in abstracts and text using linear models and word proximity networks". *Genome Biology*. **9**(Suppl 2):S1.  
A. Abi-Haidar and L.M. Rocha [2008]. "Adaptive Spam Detection Inspired by a Cross-Regulation Model of Immune Dynamics: A Study of Concept Drift". In: *Artificial Immune Systems. LNCS*, **5132**: 36-47.  
M. Marques-Pita, M. Mitchell, and L.M. Rocha [2008]. "The Role of Conceptual Structure in Learning Cellular Automata to Perform Collective Computation". In: *Unconventional Computation. LNCS*, **5204**: 146-163.  
Rocha, L.M., C. Huang, A. Maguitman, J. Kaur. [2007]. "Agent-based Model of Genotype Editing". *Evolutionary Computation*. **15** (3): 253-89.  
Rocha, L.M., M. Bedau, D. Floreano, R. Goldstone, A. Vespignani, and L. Yaeger (Eds.) [2006]. *Artificial Life 10: Proceedings of the 10<sup>th</sup> Int. Conference on the Simulation and Synthesis of Living Systems*. MIT Press.  
Rocha, L.M., A. Maguitman, C. Huang, J. Kaur, and S. Narayanan. [2006]. "An Evolutionary Model of Genotype Editing". In: *Artificial Life 10*: MIT Press, In Press.  
Maguitman, A.G., A. Rechtsteiner, K. Verspoor, C.E. Strauss, L.M. Rocha [2006]. "Large-Scale Testing Of Bibliome Informatics Using Pfam Protein Families". In: *Pacific Symposium on Biocomputing 2006*, pp 76-87.  
Rocha, Luis M. And W. Hordijk [2005]. "Material Representations: From the Genetic Code to the Evolution of Cellular Automata". *Artificial Life*. **11** (1-2), pp. 189 - 214.  
Verspoor, K., J. Cohn, C. Joslyn, S. Mniszewski, A. Rechtsteiner, L.M. Rocha, T. Simas [2005]. *BMC Bioinformatics*. **6**(Suppl 1): S20. doi:10.1186/1471-2105-6-S1-S20.  
Rocha, L.M., T. Simas, A. Rechtsteiner, M. DiGiacomo, R. Luce [2005]. "MyLibrary@LANL: In: *Proc. Int. Conf. Web Intelligence (WI'05)*, IEEE Press. pp. 565-571.  
Wall, Michael E., Andreas Rechtsteiner, and Luis M. Rocha [2003]. "Singular Value Decomposition and Principal Component Analysis". In: *Understanding And Using Microarray Analysis Techniques*. Kluwer, pp. 91-109.