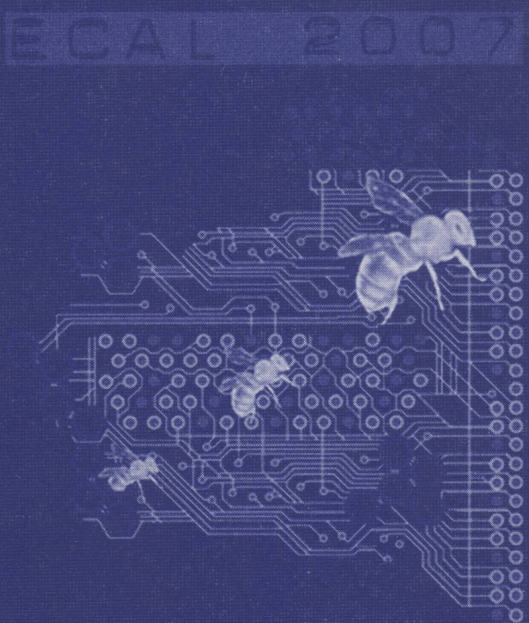
Fernando Almeida e Costa
Luis Mateus Rocha Ernesto Costa
Inman Harvey António Coutinho (Eds.)

LNAI 4648

Advances in Artificial Life

9th European Conference, ECAL 2007
Lisbon, Portugal, September 2007
Proceedings



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Series Editors

Jaime G. Carbonell, Carnegie Mellon University, Pittsburgh, PA, USA
Jörg Siekmann, University of Saarland, Saarbrücken, Germany

Volume Editors

Fernando Almeida e Costa
University of Sussex, Centre for Computational Neuroscience and Robotics
Brighton BN1 9QG, UK,
E-mail: F.AlmeidaCosta@sussex.ac.uk

Luis Mateus Rocha
Indiana University, School of Informatics
Bloomington, IN 47406, USA
E-mail: rocha@indiana.edu

Ernesto Costa
University of Coimbra, Department of Informatics
3030-290 Coimbra, Portugal
E-mail: ernesto@dei.uc.pt

Inman Harvey
University of Sussex, Department of Informatics
Brighton BN1 9QH, UK
E-mail: inmanh@sussex.ac.uk

António Coutinho
Gulbenkian Institute of Science
2781-901 Oeiras, Portugal
E-mail: coutinho@igc.gulbenkian.pt

Library of Congress Control Number: 2007934544
CR Subject Classification (1998): I.2, J.3, F.1.1-2, G.2, H.5, I.5, J.4, J.6

LNCS Sublibrary: SL 7 – Artificial Intelligence

ISSN 0302-9743
ISBN-10 3-540-74912-8 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-74912-7 Springer Berlin Heidelberg New York

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Printed in Germany

Typesetting: Camera-ready by author, data conversion by Markus Richter, Heidelberg
Printed on acid-free paper SPIN: 12122318 06/3180 5 4 3 2 1 0

Lecture Notes in Artificial Intelligence 4648

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

Inman Harvey, Antonio Tomé (Eds.)

Advances in Artificial Life

9th European Conference, ECAL 2007
Lisbon, Portugal, September 10-14, 2007
Proceedings

Springer

Preface

The use of methodologies of synthesis implemented in computational, robotic or other artificial architectures, aiming at the study of life-like processes, is the hallmark of artificial life. This synthetic approach is linked both to scientific and technological desiderata. Scientifically, it provides a glimpse of possible biological architectures beyond the ones provided by nature, which may play a fundamental role in the constitution of a lawful science of life. Technologically, it helps us discover solutions for hard engineering problems, non-intuitive to humanly biased approaches. This close proximity of science and technology, of content and medium, allows for the search of general organizational principles that bring together, much closer than usually thought, life, mind and social systems.

In this edition of ECAL, alongside the usual areas that roughly maintained their level of contribution, two areas received particular attention from researchers, having significantly increased their presence: social systems (15 papers) and ecosystems (7 papers).

Another issue perhaps worth noting is the number of papers dealing, in one way or another, with the theme of the constitution of meaning. This theme runs across various sections of the proceedings but, to cite only the obvious examples, the sections on communication and on social systems total 28 papers.

From the original 172 submissions, 38 papers were accepted for oral presentation and 82 for poster presentation. They are published in these proceedings without distinction. The conference being of one-track session type, only a few papers could be accepted for oral presentation and that decision was a very difficult one. Many papers accepted for poster presentation are of very high scientific standards.

This proceedings volume is organized into 15 sections. Although every classification is to some extent arbitrary, sections 1 to 4 form a group that could be labeled *Life*, sections 5 to 9 another group that could be labeled *Cognition*; then, sections 10 and 11, *Social Systems*, and finally, sections 12 to 15, *Tools, Models, Methodologies.*

These papers were distributed over the four days of the conference in a way that generally corresponds to the themes highlighted each day: *Cognition and Embodiment, Complex Systems and Networks, Communication and Social Systems,* and *The Relation Between Alife and Biology, Open Issues.*

The thematic organization of the conference on each day was matched by the content of the keynote lectures. We are profoundly indebted to a group of outstanding keynote speakers who graciously accepted our invitation to address the conference. For a special keynote lecture, in the opening ceremony, we invited Dario Floreano. For the *Cognition and Embodiment* day, we invited Rudolf Bannasch and Randall Beer, for the *Complex Systems and Networks* day, António Coutinho and Janet Wiles, for the *Communication and Social Systems* day, Pe-

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ter Todd and Ezequiel Di Paolo, for *The Relation Between Alife and Biology* day, Ricard Solé and Brian Goodwin.

It was our wish to promote the vivid discussion of particularly controversial or critical issues. With this objective in mind, panel discussions were organized, at the end of each day, highlighting a particular critical point, with the presence of the keynote speakers of that day and three other discussants. These panel discussions took place in plenary sessions.

The most important scientific component of a conference is the paper reviewing process. With very few exceptions, the submitted papers were reviewed by at least three reviewers. This was only possible due to the professionalism and extreme care of the 100 members of the Program Committee to whom we are deeply grateful.

Finally, we thank the support granted by the Portuguese Foundation for Science and Technology. We also thank the IGC – Gulbenkian Institute of Science, for assuming the role of host institution of the event, and for the general support provided.

July 2007

Fernando Almeida e Costa
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Inman Harvey
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