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Bioinspired Models of Network, Information, and Computing Systems

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Revised Selected Papers

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Preface

This volume of LNICST is a collection of the papers of the 4th International Conference on Bio-Inspired Models of Network, Information, and Computing Systems (Bionetics). The event took place in the medieval city of Avignon, known also as the City of the Popes, during December 9 to 11, 2009. Bionetics main objective is to bring bio-inspired paradigms into computer engineereing and networking, and to enhance the fruitful interactions between these fields and biology.

The program of the conference indeed includes applications of various paradigms that have their origin in biology: population dynamics, branching processes, ant colony optimization. The proceedings include 19 papers covering a broad range of important issues in areas related to bio-inspired technologies. They correspond to presentations at 6 technical sessions. Four papers correspond to an invited session on the Epidemic-type forwarding in DTNs (sparse mobile ad-hoc wireless networks) organized by Dr Francesco De Pellegrini, (Italy, CREATE-NET). The following 9 papers (selected out of 15 submissions) correspond to contributions to regular sessions on Bio-inspired security, Bio-Inspired Networking, Bioinspired algorithms and software systems. The remaining 6 papers (selected out of a total of 9 submissions) are dedicated to work in progress. For each paper, we have provided at least two independent reviews, most of which were offered by members of the TPC.

Four keynote talks were presented at the conference by the following outstanding scientists: George KESIDIS (Professor of Electrical Engineering and Computer Science and Engineering, The Pennsylvania State University) who presented "Epidemiology of the spread of virus/worms in the Internet", Vivek S. BORKAR (Professor, School of Technology and Computer Science, Tata Institute of Fundamental Research, India) who gave a talk on "Variation of ant colony optimization for network problems", Wolfgang BANZHAF (Professor and Head Department of Computer Science, Memorial University of Newfoundland, Canada) who gave a talk on "Science and Engineering of Complex Systems". Finally, Nicolas CHAMPAGNAT (CR, INRIA Sophia Antipolis - Mediterranee) presenteed a talk on modelling Darwinian evolution, resulting from the interplay of phenotypic variation and natural selection through ecological interactions. We are very grateful for the participation of these speakers.

The conference included a session in the memory of Prof Thomas Vincent who was among the founders of evolutionary game theory. He was a professor in the Aerospace and Mecanical Engineering, and was a pioneer in bringing bio-inspired techniques into engineering. The session was composed of the keynote talk of Nicolas Champagnat as well as three invited talks by Pierre Bernhard, Bruno Gaujal and Eitan Altman. The success of this conference along with this proceeding volume is due in a large extent to the devoted work of the 28 TPC members to whom we thank. Special thanks are due to the conference steering committee and organizing committee for their help

that made our job much easier and enjoyable. Warm thanks go to Ephie Deriche, Amar Azad, Tembine Hamidou, Tania Jimenez, Issam Mabrouki and Maria Morozova. We wish to thank our sponsors - ICST, Createnet, PerAda, INRIA, University of Avignon and Bionets.

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