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Joaquim Marques de Sá Luís A. Alexandre
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Preface

This book includes the proceedings of the International Conference on Artificial Neural Networks (ICANN 2007) held during September 9–13, 2007 in Porto, Portugal, with tutorials being presented on September 9, the main conference taking place during September 10–12 and accompanying workshops held on September 13, 2007. The ICANN conference is organized annually by the European Neural Network Society in co-operation with the International Neural Network Society, the Japanese Neural Network Society, and the IEEE Computational Intelligence Society. It is the premier European event covering all topics related to neural networks and cognitive systems. The ICANN series of conferences was initiated in 1991 and soon became the major European gathering for experts in these fields. In 2007 the ICANN conference was organized by the Biomedical Engineering Institute (INEB - Instituto de Engenharia Biomédica), Porto, Portugal, with the collaboration of the University of Beira Interior (UBI - Universidade da Beira Interior), Covilhã, Portugal and ISEP, Polytechnic Engineering School, Porto, Portugal. From 376 papers submitted to the conference, 197 papers were selected for publication and presentation, following a blind peer-review process involving the Program Chairs and International Program Committee; 27 papers were presented in oral special sessions; 123 papers were presented in oral regular sessions; 47 papers were presented in poster sessions. The quality of the papers received was very high; as a consequence, it was not possible to accept and include in the conference program many papers of good quality. A variety of topics constituted the focus of paper submissions. In regular sessions, papers addressed the following topics: computational neuroscience and neurocognitive studies, applications in biomedicine and bioinformatics, spiking neural networks, data clustering, signal and times series processing, learning theory, advances in neural network learning methods, advances in neural network architectures, data analysis, neural dynamics and complex systems, ensemble learning, self-organization, robotics and control, pattern recognition, text mining and Internet applications, vision and image processing. Special sessions, organized by distinguished researchers, focused on significant aspects of current research, namely: emotion and attention, understanding and creating cognitive systems, temporal synchronization and nonlinear dynamics in neural networks, complex-valued neural networks. Papers presented in poster sessions were organized in the following topics: real-world applications, signal and time series processing, advances in neural network architectures, advances in neural network training, meta learning, independent component analysis, graphs, evolutionary computing, estimation, spatial and spatio-temporal learning. Prominent lecturers gave six keynote speeches at the conference. Moreover, well-known researchers presented seven tutorials on state-of-the-art topics. Four post-conference workshops, entitled “Cognitive Systems”, “Neural Networks in Biomedical Engineering and

Bioinformatics”, “What It Means to Communicate” and “Neural Networks of the Future?”, concluded the focus of ICANN 2007 on the state-of-the-art research on neural networks and intelligent technologies. An in-depth discussion was held on the prospects and future developments both in theory and practice in those important topics. We would like to thank all the members of the local committee for their contribution to the organization of ICANN 2007. A special thanks to Alexandra Oliveira whose dedication and work quality were a major guarantee of the success of ICANN 2007. We also wish to thank Alfred Hofmann and the LNCS team from Springer for their help and collaboration in the publication of the ICANN 2007 proceedings.

July 2007

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