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Artificial Neural Networks – ICANN 2006

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Proceedings, Part I

1 Part I

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Preface

This book includes the proceedings of the International Conference on Artificial Neural Networks (ICANN 2006) held on September 10-14, 2006 in Athens, Greece, with tutorials being presented on September 10, the main conference taking place during September 11-13 and accompanying workshops on perception, cognition and interaction held on September 14, 2006.

The ICANN conference is organized annually by the European Neural Network Society in cooperation 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 concerned with neural networks and related areas. The ICANN series of conferences was initiated in 1991 and soon became the major European gathering for experts in these fields.

In 2006 the ICANN Conference was organized by the Intelligent Systems Laboratory and the Image, Video and Multimedia Systems Laboratory of the National Technical University of Athens in Athens, Greece.

From 475 papers submitted to the conference, the International Program Committee selected, following a thorough peer-review process, 208 papers for publication and presentation to 21 regular and 10 special sessions. The quality of the papers received was in general 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 topics such as learning algorithms, hybrid architectures, neural dynamics and complex systems, self-organization, computational neuroscience, connectionist cognitive science, neural control, robotics and planning, data analysis, signal and time series processing, image and vision analysis, pattern recognition and applications to bioinformatics, market analysis and other real-world problems.

Special sessions, organized by distinguished researchers, focused on significant aspects of current neural network research, including cognitive machines, Semantic Web technologies and multimedia analysis, bridging the semantic gap in multimedia machine learning approaches, feature selection and dimension reduction for regression, learning random neural networks and stochastic agents, visual attention algorithms and architectures for perceptional understanding and video coding, neural computing in energy engineering, bio-inspired neural network on-chip implementation and applications, computational finance and economics.

Prominent lecturers provided key-note speeches for the conference. Moreover, tutorials were given by well-known researchers. John Taylor was the honorary Chair of the conference.

Three post-conference workshops, on intelligent multimedia, semantics, interoperability and e-culture, on affective computing and interaction and on cognitive machines, concluded the focus of ICANN 2006 on the state-of-the-art research on neural networks and intelligent technologies in relation to the domains of cognition, perception and interaction. In-depth discussion was made on the prospects and future

developments of the theoretical developments and applications of neural network models, algorithms and systems in the fields of cognition, neurobiology, semantics, perception and human computer interaction.

We would like to thank all members of the organizing laboratories for their contribution to the organization of the conference. In particular we wish to thank Lori Malatesta and Eleni Iskou, who greatly helped in handling a variety of technical and administrative problems related to the conference organization. Finally, we wish to thank Alfred Hofmann and Christine Guenther from Springer for their help and collaboration in the publication of the ICANN proceedings.

July 2006 Stefanos Kollias, Andreas Stafylopatis

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