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Joaquim Marques de Sá
Luís A. Alexandre
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Danilo Mandic (Eds.)

Artificial Neural Networks – ICANN 2007

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Proceedings, Part II

2 Part II



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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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Table of Contents – Part II

Computational Neuroscience, Neurocognitive Studies

A Marker-Based Model for the Ontogenesis of Routing Circuits	1
<i>Philipp Wolfrum and Christoph von der Malsburg</i>	
A Neural Network for the Analysis of Multisensory Integration in the Superior Colliculus	9
<i>Cristiano Cuppini, Elisa Magosso, Andrea Serino, Giuseppe Di Pellegrino, and Mauro Ursino</i>	
Neurotransmitter Fields	19
<i>Douglas S. Greer</i>	
SimBa: A Fuzzy Similarity-Based Modelling Framework for Large-Scale Cerebral Networks	29
<i>Julien Erny, Josette Pastor, and Henri Prade</i>	
A Direct Measurement of Internal Model Learning Rates in a Visuomotor Tracking Task	39
<i>Abraham K. Ishihara, Johan van Doornik, and Terence D. Sanger</i>	
Spatial and Temporal Selectivity of Hippocampal CA3 and Its Contribution to Sequence Disambiguation	49
<i>Toshikazu Samura, Motonobu Hattori, and Shun Ishizaki</i>	
Lateral and Elastic Interactions: Deriving One Form from Another	59
<i>Valery Tereshko</i>	

Applications in Biomedicine and Bioinformatics

A Survey on Use of Soft Computing Methods in Medicine	69
<i>Ahmet Yardimci</i>	
Exploiting Blind Matrix Decomposition Techniques to Identify Diagnostic Marker Genes	80
<i>Reinhard Schachtner, Dominik Lutter, Fabian J. Theis, Elmar W. Lang, Ana Maria Tomé, and Gerd Schmitz</i>	
Neural Network Approach for Mass Spectrometry Prediction by Peptide Prototyping	90
<i>Alexandra Scherbart, Wiebke Timm, Sebastian Böcker, and Tim W. Nattkemper</i>	

Identifying Binding Sites in Sequential Genomic Data 100
*Mark Robinson, Cristina González Castellano, Rod Adams,
Neil Davey, and Yi Sun*

On the Combination of Dissimilarities for Gene Expression Data
Analysis 110
Ángela Blanco, Manuel Martín-Merino, and Javier De Las Rivas

A Locally Recurrent Globally Feed-Forward Fuzzy Neural Network for
Processing Lung Sounds 120
*Paris A. Mastorocostas, Dimitris N. Varsamis,
Costas A. Mastorocostas, and Costas S. Hilas*

Learning Temporally Stable Representations from Natural Sounds:
Temporal Stability as a General Objective Underlying Sensory
Processing 129
Armin Duff, Reto Wyss, and Paul F.M.J. Verschure

Comparing Methods for Multi-class Probabilities in Medical Decision
Making Using LS-SVMs and Kernel Logistic Regression 139
*Ben Van Calster, Jan Luts, Johan A.K. Suykens, George Condous,
Tom Bourne, Dirk Timmerman, and Sabine Van Huffel*

Classifying EEG Data into Different Memory Loads Across Subjects... 149
Liang Wu and Predrag Neskovic

Information Theoretic Derivations for Causality Detection: Application
to Human Gait 159
Gert Van Dijck, Jo Van Vaerenbergh, and Marc M. Van Hulle

Pattern Recognition

Template Matching for Large Transformations 169
Julian Eggert, Chen Zhang, and Edgar Körner

Fuzzy Classifiers Based on Kernel Discriminant Analysis 180
Ryota Hosokawa and Shigeo Abe

An Efficient Search Strategy for Feature Selection Using Chow-Liu
Trees 190
Erik Schaffernicht, Volker Stephan, and Horst-Michael Groß

Face Recognition Using Parzenfaces 200
Zhirong Yang and Jorma Laaksonen

A Comparison of Features in Parts-Based Object Recognition
Hierarchies 210
Stephan Hasler, Heiko Wersing, and Edgar Körner

An Application of Recurrent Neural Networks to Discriminative Keyword Spotting.....	220
<i>Santiago Fernández, Alex Graves, and Jürgen Schmidhuber</i>	
Spatiostructural Features for Recognition of Online Handwritten Characters in Devanagari and Tamil Scripts	230
<i>H. Swethalakshmi, C. Chandra Sekhar, and V. Srinivasa Chakravarthy</i>	
An Improved Version of the Wrapper Feature Selection Method Based on Functional Decomposition	240
<i>Noelia Sánchez-Marroño, Amparo Alonso-Betanzos, and Beatriz Pérez-Sánchez</i>	
Parallel-Series Perceptrons for the Simultaneous Determination of Odor Classes and Concentrations.....	250
<i>Gao Daqi, Sun Jianli, and Li Xiaoyan</i>	
Probabilistic Video-Based Gesture Recognition Using Self-organizing Feature Maps.....	261
<i>George Caridakis, Christos Pateritsas, Athanasios Drosopoulos, Andreas Stafylopatis, and Stefanos Kollias</i>	
Unbiased SVM Density Estimation with Application to Graphical Pattern Recognition	271
<i>Edmondo Trentin and Ernesto Di Iorio</i>	
Neural Mechanisms for Mid-Level Optical Flow Pattern Detection.....	281
<i>Stefan Ringbauer, Pierre Bayerl, and Heiko Neumann</i>	
Data Clustering	
Split–Merge Incremental LEarning (SMILE) of Mixture Models	291
<i>Konstantinos Blekas and Isaac E. Lagaris</i>	
Least-Mean-Square Training of Cluster-Weighted Modeling	301
<i>I-Chun Lin and Cheng-Yuan Liou</i>	
Identifying the Underlying Hierarchical Structure of Clusters in Cluster Analysis	311
<i>Kazunori Iwata and Akira Hayashi</i>	
Clustering Evaluation in Feature Space	321
<i>Alissar Nasser, Pierre-Alexandre Hébert, and Denis Hamad</i>	
A Topology-Independent Similarity Measure for High-Dimensional Feature Spaces	331
<i>Jochen Kerdels and Gabriele Peters</i>	

Self-organization

Fuzzy Labeled Self-organizing Map with Kernel-Based Topographic Map Formation	341
<i>Iván Machón González and Hilario López García</i>	
Self-organizing Maps of Spiking Neurons with Reduced Precision of Correlated Firing	349
<i>Francisco J. Veredas, Luis A. Martínez, and Héctor Mesa</i>	
Visualising Class Distribution on Self-organising Maps	359
<i>Rudolf Mayer, Taha Abdel Aziz, and Andreas Rauber</i>	
Self-organizing Maps with Refractory Period	369
<i>Antonio Neme and Victor Mireles</i>	
Improving the Correlation Hunting in a Large Quantity of SOM Component Planes	379
<i>Miguel A. Barreto S. and Andrés Pérez-Urbe</i>	
A Dynamical Model for Receptive Field Self-organization in V1 Cortical Columns	389
<i>Jörg Lücke</i>	

Text Mining and Internet Applications

Meta-evolution Strategy to Focused Crawling on Semantic Web	399
<i>Jason J. Jung, Geun-Sik Jo, and Seong-Won Yeo</i>	
Automated Text Categorization Based on Readability Fingerprints	408
<i>Mark J. Embrechts, Jonathan Linton, Walter F. Bogaerts, Bram Heyns, and Paul Evangelista</i>	
Personalized Web Page Filtering Using a Hopfield Neural Network	417
<i>Armando Marin, Juan Manuel Adán-Coello, João Luís Garcia Rosa, Carlos Miguel Tobar, and Ricardo Luís de Freitas</i>	
Robust Text Classification Using a Hysteresis-Driven Extended SRN ...	425
<i>Garen Arevian and Christo Panchev</i>	
Semi-supervised Metrics for Textual Data Visualization	435
<i>Ángela Blanco and Manuel Martín-Merino</i>	
Topology Aware Internet Traffic Forecasting Using Neural Networks	445
<i>Paulo Cortez, Miguel Rio, Pedro Sousa, and Miguel Rocha</i>	

Signal and Times Series Processing

Boosting Algorithm to Improve a Voltage Waveform Classifier Based on Artificial Neural Network	455
<i>Milde M.S. Lira, Ronaldo R.B. de Aquino, Aida A. Ferreira, Manoel A. Carvalho Jr, Otoni Nóbrega Neto, Gabriela S.M. Santos, and Carlos Alberto B.O. Lira</i>	
Classification of Temporal Data Based on Self-organizing Incremental Neural Network	465
<i>Shogo Okada and Osamu Hasegawa</i>	
Estimating the Impact of Shocks with Artificial Neural Networks	476
<i>Konstantinos Nikolopoulos, Nikolaos Bougioukos, Konstantinos Giannelos, and Vassilios Assimakopoulos</i>	
Greedy KPCA in Biomedical Signal Processing	486
<i>Ana Rita Teixeira, Ana Maria Tomé, and Elmar W. Lang</i>	
The Use of Artificial Neural Networks in the Speech Understanding Model - SUM	496
<i>Daniel Nehme Müller, Mozart Lemos de Siqueira, and Philippe O.A. Navaux</i>	
On Incorporating Seasonal Information on Recursive Time Series Predictors	506
<i>Luis Javier Herrera, Hector Pomares, Ignacio Rojas, Alberto Guilén, and G. Rubio</i>	
Can Neural Networks Learn the “Head and Shoulders” Technical Analysis Price Pattern? Towards a Methodology for Testing the Efficient Market Hypothesis	516
<i>Achilleas Zapranis and Evi Samolada</i>	
Sparse Least Squares Support Vector Regressors Trained in the Reduced Empirical Feature Space	527
<i>Shigeo Abe and Kenta Onishi</i>	

Vision and Image Processing

Content-Based Image Retrieval by Combining Genetic Algorithm and Support Vector Machine	537
<i>Kwang-Kyu Seo</i>	
Global and Local Preserving Feature Extraction for Image Categorization	546
<i>Rongfang Bie, Xin Jin, Chuan Xu, Chuanliang Chen, Anbang Xu, and Xian Shen</i>	

Iris Recognition for Biometric Personal Identification Using Neural Networks 554
Rahib H. Abiyev and Koray Altunkaya

No-Reference Quality Assessment of JPEG Images by Using CBP Neural Networks 564
Paolo Gastaldo, Giovanni Parodi, Judith Redi, and Rodolfo Zunino

A Bio-inspired Connectionist Approach for Motion Description Through Sequences of Images..... 573
Claudio Castellanos-Sánchez

Color Object Recognition in Real-World Scenes 583
Alexander Gepperth, Britta Mersch, Jannik Fritsch, and Christian Goerick

Estimation of Pointing Poses on Monocular Images with Neural Techniques - An Experimental Comparison 593
Frank-Florian Steege, Christian Martin, and Horst-Michael Groß

Real-Time Foreground-Background Segmentation Using Adaptive Support Vector Machine Algorithm 603
Zhifeng Hao, Wen Wen, Zhou Liu, and Xiaowei Yang

Edge-Preserving Bayesian Image Superresolution Based on Compound Markov Random Fields 611
Atsunori Kanemura, Shin-ichi Maeda, and Shin Ishii

Robotics, Control

A Neurofuzzy Controller for a Single Link Flexible Manipulator 621
Samaneh Sarraf, Ali Fallah, and T. Seyedena

Suboptimal Nonlinear Predictive Control with Structured Neural Models 630
Maciej Ławryńczuk

Neural Dynamics Based Exploration Algorithm for a Mobile Robot..... 640
Jeff Bueckert and Simon X. Yang

Neural Models in Computationally Efficient Predictive Control Cooperating with Economic Optimisation 650
Maciej Ławryńczuk

Event Detection and Localization in Mobile Robot Navigation Using Reservoir Computing 660
Eric A. Antonelo, Benjamin Schrauwen, Xavier Dutoit, Dirk Stroobandt, and Marnix Nuttin