

Stefanos Kollias
Andreas Stafylopatis
Włodzisław Duch
Erkki Oja (Eds.)

LNCS 4132

Artificial Neural Networks – ICANN 2006

16th International Conference
Athens, Greece, September 2006
Proceedings, Part II

2 Part II

 Springer

Stefanos Kollias Andreas Stafylopatis
Włodzisław Duch Erkki Oja (Eds.)

Artificial Neural Networks – ICANN 2006

16th International Conference
Athens, Greece, September 10 – 14, 2006
Proceedings, Part I

江苏工业学院图书馆
藏书章

Volume Editors

Stefanos Kollias
Andreas Stafylopatis
National Technical University of Athens
School of Electrical and Computer Engineering
157 80 Zographou, Athens, Greece
E-mail: {stefanos,andreas}@cs.ntua.gr

Włodzisław Duch
Nicolaus Copernicus University
Department of Informatics
ul. Grudziadzka 5, 87-100 Torun, Poland
E-mail: wduch@phys.uni.torun.pl

Erkki Oja
Helsinki University of Technology
Laboratory of Computer and Information Science
P.O. Box 5400, 02015 Hut, Finland
E-mail: erkki.oja@hut.fi

Library of Congress Control Number: 2006931797

CR Subject Classification (1998): F.1, I.2, I.5, I.4, G.3, J.3, C.2.1, C.1.3

LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues

ISSN	0302-9743
ISBN-10	3-540-38871-0 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-38871-5 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2006
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11840930 06/3142 5 4 3 2 1 0

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 perceptual 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

Organization

General Chair

Stefanos Kollias,
National Technical University of Athens

Co-Chair

Andreas Stafylopatis, NTUA, Greece

Program Chair

Wlodzislaw Duch, Torun, Poland and Singapore
ENNS President
Erkki Oja, Helsinki, Finland

Honorary Chair

John G. Taylor, Kings College, London, UK; ENNS Past President

International Program Committee

- **Hojat Adeli,** Ohio State University, USA
- **Peter Andras,** University of Newcastle, UK
- **Marios Angelides,** Brunel University, UK
- **Panos Antsaklis,** University of N. Dame, USA
- **Bruno Apolloni,** University of Milan, Italy
- **Nikolaos Bourbakis,** Wright State University, USA
- **Peter Erdi,** University of Budapest, Hungary and Kalamazoo
- **Georg Dorffner,** University of Vienna, Austria
- **Patrick Gallinari,** Université Paris 6, France
- **Christophe Garcia,** France Telecom
- **Erol Gelenbe,** Imperial College, UK
- **Stan Gielen,** University of Nijmegen, The Netherlands
- **Pascal Hitzler,** University of Karlsruhe, Germany
- **Nikola Kasabov,** Kedri, Australia, New Zealand
- **Janusz Kacprzyk,** Warsaw, Poland
- **Okyay Kaynak,** Bogazici University, Turkey
- **Chris Koutsougeras,** Tulane University, USA
- **Thomas Martinetz,** University of Luebeck, Germany
- **Evangelia Micheli-Tzanakou,** Rutgers University, USA

- **Lars Niklasson**, Skövde University, Sweden
- **Andreas Nuernberger**, University of Magdeburg, Germany
- **Marios Polycarpou**, University of Cyprus
- **Demetris Psaltis**, Caltech, USA
- **Branimir Reljin**, University of Belgrade, Serbia
- **Olli Simula**, Technical University of Helsinki, Finland
- **Alessandro Sperduti**, University of Padova, Italy
- **Lefteris Tsoukalas**, Purdue University, USA
- **Michel Verleysen**, Louv.-la-Neuve, Belgium
- **Alessandro Villa**, University of Grenoble, France

Local Organizing Committee

- **Yannis Avrithis**, ICCS-NTUA
- **Christos Douligeris**, Piraeus University
- **George Dounias**, Aegean University
- **Kostas Karpouzis**, ICCS-NTUA
- **Aris Likas**, University of Ioannina
- **Konstantinos Margaritis**, University of Macedonia
- **Vassilis Mertzios**, DUTH
- **Stavros Perantonis**, NCSR Demokritos
- **Yannis Pitas**, AUTH, Salonica
- **Costas Pattichis**, University of Cyprus
- **Apostolos Paul Refenes**, AUEB
- **Christos Schizas**, University of Cyprus
- **Giorgos Stamou**, ICCS-NTUA
- **Sergios Theodoridis**, UoA
- **Spyros Tzafestas**, NTUA
- **Nicolas Tsapatsoulis**, University of Cyprus
- **Mihalis Zervakis**, TUC, Crete

Reviewers

Abe	Shigeo	Kobe University
Adamczak	Rafal	Nicholas Copernicus University
Aioli	Fabio	University of Pisa
Akrivas	George	National Technical University of Athens
Albrecht	Andreas	University of Hertfordshire
Alhoniemi	Esa	University of Turku
Andonie	Razvan	Central Washington University
Anguita	Davide	University of Genoa
Angulo-Bahon	Cecilio	Univ. Politecnica de Catalunya, Spain
Archambeau	Cedric	Université Catholique de Louvain
Atencia	Miguel	Universidad de Malaga

Aupetit	Michael	Commissariat à l'Energie Atomique
Avrithis	Yannis	National Technical University of Athens
Bedoya	Guillermo	Technical University of Catalonia, Spain
Bianchini	Monica	Università di Siena
Boni	Andrea	University of Trento
Caputo	Barbara	Royal Institute of Technology
Caridakis	George	National Technical University of Athens
Cawley	Gavin	University of East Anglia
Chetouani	Mohamed	Université Paris
Chortaras	Alexandros	National Technical University of Athens
Cichocki	Andrzej	RIKEN
Clady	Xavier	Université Pierre et Marie Curie
Corchado	Emilio	Applied Computational Intelligence Unit
Cottrell	Marie	Université Paris I
Crook	Nigel	Oxford Brookes University
Dablemont	Simon	Université Catholique de Louvain
Delannay	Nicolas	Université Catholique de Louvain
Derpanis	Kostas	York University
Dimitrakakis	Christos	IDIAP
Dominguez Merino	Enrique	E.T.S.I. Informatica, Spain
Dorransoro	Jose	Universidad Autónoma de Madrid
Douligeris	Christos	Piraeus University
Dounias	George	Aegean University
Drosopoulos	Nasos	National Technical University of Athens
Duch	Wlodzislaw	Nicolaus Copernicus University
Elizondo	David	De Montfort University
Ferles	Christos	National Technical University of Athens
Flanagan	Adrian	Nokia Research Center
Francois	Damien	Université Catholique de Louvain
Fyfe	Colin	University of Paisley
Garcia-Pedrajas	Nicolas	University of Cordoba
Gas	Bruno	LISIF-UPMC
	Luis	Facultad Ciencias Economicas y Empresari
Gonzales Abril		
Goser	Karl	Universitaet Dortmund
Gosselin	Bernard	Faculté Polytechnique de Mons
Grana	Manuel	Univ. Pais Vasco
Grothmann	Ralph	University of Bremen
Hammer	Barbara	University of Osnabrueck
Haschke	Robert	Bielefeld University
Hatziargyriou	Nikos	National Technical Univesity of Athens
Heidemann	Gunther	Bielefeld University
Hollmen	Jaakko	Technical University of Helsinki

Honkela	Antti	Helsinki University of Technology
Hryniewicz	Olgiard	Systems Research Institute PAS
Huang	Di	City University of Hong Kong
Huang	Te-Ming	The University of Auckland
Huelse	Martin	Fraunhofer Institut
Igel	Christian	Ruhr-Universitaet Bochum
Indiveri	Giacomo	UNI-ETH Zurich
Isasi	Pedro	Universidad Carlos III de Madrid
Ishii	Shin	Nara Institute of Science and Technology
Ito	Yoshifusa	Aichi-Gakuin University
Jirina	Marcel	Acad. of Sciences of the Czech Republic
Kaban	Ata	University of Birmingham
Kalveram	Karl Theodor	Institute of Experimental Psychology
Karpouzis	Kostas	ICCS-NTUA
Kasderidis	Stathis	Institute of Computer Science - FORTH
Kim	DaeEun	Max Planck Institute for Psychological Research
Kollias	Stefanos	National Technical University of Athens
Korbicz	Jozef	UZG
Koronacki	Jacek	IPI PAN
Koskela	Markus	Technical University of Helsinki
Kosmopoulos	Dimitris	National Centre for Scientific Research
Kounoudes	Anastasios	SignalGenerix Ltd
Kouropteva	Olga	University of Oulu
Kurfess	Franz	California Polytechnic State University
Kurzynski	Marek	Wroclaw University of Technology
Laaksonen	Jorma	Technical University of Helsinki
Lang	Elmar	University of Regensburg
Leclercq	Edouard	Université du Havre
Lee	John	Université Catholique de Louvain
Lehtimäki	Pasi	Helsinki University of Technology
Leiviska	Kauko	University of Oulu
Lendasse	Amaury	Helsinki University of Technology
Likas	Aris	University of Ioannina
Loizou	Christos	Intercollege, Limassol Campus
Madrenas	Jordi	Technical University of Catalunya
Malatesta	Lori	National Technical University of Athens
Mandziuk	Jacek	Warsaw University of Technology
Marchiori	Elena	Vrije Universiteit Amsterdam
Marcu	Teodor	University of Duisburg-Essen
Markellos	Raphael	Athens University of Economics and Business
Markowska-Kaczmar	Urszula	Wroclaw University of Technology

Martin-Merino	Manuel	University Pontificia of Salamanca
Masulli	Francesco	Polo Universitario di La Spezia G.Marco
Micheli	Alessio	University of Pisa
Morra	Lia	Politecnico di Torino
Moutarde	Fabien	Ecole des Mines de Paris
Mueller	Klaus-Robert	University of Potsdam
Muresan	Raul	SC. NIVIS SRL
Nakayama	Minoru	CRADLE
Nikolopoulos	Konstantinos	Lancaster University Management School
Ntalianis	Klimis	National Technical University of Athens
Oja	Erkki	Helsinki University of Technology
Olteanu	Madalina	Université Paris 1
Ortiz Boyer	Domingo	University of Cordoba
Osowski	Stanislaw	Warsaw University of Technology
Parra	Xavier	Technical University of Catalonia
Pateritsas	Christos	National Technical University of Athens
Pattichis	Marios	University of New Mexico
Pattichis	Costas	University of Cyprus
Paugam-Moisy	Helene	Institut des Sciences Cognitives
Pedreira	Carlos	Catholic University of Rio de Janeiro
Pelckmans	Kristiaan	K.U.Leuven
Perantonis	Stavros	NCSR Demokritos
Pertselakis	Minas	National Technical University of Athens
Peters	Gabriele	Universitaet Dortmund
Pieगत	Andrzej	Uniwersytet Szczecinski
Pitas	Yannis	Aristotle University of Thessaloniki
Polani	Daniel	University of Hertfordshire
Porrmann	Mario	Heinz Nixdorf Institute
Prevost	Lionel	Lab. Instr. et Systèmes d'Ile de France
Prevotet	Jean-Christophe	Université Pierre et Marie Curie, Paris
Raivio	Kimmo	Helsinki University of Technology
Raouzeou	Amaryllys	National Technical University of Athens
Rapantzikos	Konstantinos	National Technical University of Athens
	Apostolos Paul	Athens University Economics & Business
Refenes		
Risto	Risto	Tampere University of Technology
Rocha	Miguel	Universidade do Minho
Romariz	Alexandre	Universidade de Brasilia
Rossi	Fabrice	INRIA Rocquencourt
Rovetta	Stefano	University of Genova
Rutkowska	Danuta	Technical University of Czestochowa
Rynkiewicz	Joseph	Université Paris 1
Salojarvi	Jarkko	Technical University of Helsinki

Schrauwen	Benjamin	Universiteit Gent
Schwenker	Friedhelm	University of Ulm
Seiffert	Udo	Leibniz Institute of Plant Genetics
Sfakiotakis	Michael	Institute of Computer Science FORTH
Sierra	Alejandro	Universidad Autónoma de Madrid
Siivola	Vesa	Technical University of Helsinki
Skodras	Thanos	University of Patras
Stafylopatis	Andreas	National Technical University of Athens
Stamou	Giorgos	ICCS-NTUA
Steil	Jochen J.	University of Bielefeld
Steuer	Michal	University of the West of England
Stoilos	Giorgos	National Technical University of Athens
Strickert	Marc	University of Osnabrueck
Suárez	Alberto	Universidad Autónoma de Madrid
Sugiyama	Masashi	Fraunhofer FIRST
Suykens	Johan	Katholieke Universiteit Leuven
Szczepaniak	Piotr	TUL
Tadeusiewicz	Ryszard	AGH
Tagliaferri	Roberto	Univ. Salerno
Taylor	John	King's College London
Terra	Marco	University of Sao Paulo
Theodoridis	Sergios	UoA
Tomas	Ana Maria	Universidade Aveiro
Trentin	Edmondo	Università di Siena
Tsakiris	Dimitris	University of Crete
Tsapatsoulis	Nicolas	University of Cyprus
Tsotsos	John	York University
Tzouvaras	Vassilis	National Technical University of Athens
Usui	Shiro	RIKEN
Van Looy	Stijn	Universiteit Gent
Vannucci	Marco	Scuola Superiore Sant'Anna
Venetis	Anastassios	National Technical University of Athens
Venna	Jarkko	Helsinki University of Technology
Verbeek	Jakob	University of Amsterdam
Viet	Nguyen Hoang	Polish Academy of Sciences
Villmann	Thomas	Clinic for Psychotherapy
Vitay	Julien	INRIA
Wallace	Manolis	National Technical University of Athens
Watanabe	Norifumi	Keio University
Wennekers	Thomas	University of Plymouth
Wiegerinck	Wim	Radboud University Nijmegen
Wira	Patrice	Universitède Haute-Alsace

Wyns
Yang
Yearwood
Zervakis
Zimmermann

Bart
Zhijun
John
Mihalis
Hans-Georg

Ghent University
University of Edinburgh
University of Ballarat
TUC
Siemens AG

Table of Contents – Part II

Neural Networks, Semantic Web Technologies and Multimedia Analysis (Special Session)

The Core Method: Connectionist Model Generation	1
<i>Sebastian Bader, Steffen Hölldobler</i>	
A Neural Scheme for Robust Detection of Transparent Logos in TV Programs	14
<i>Stefan Duffner, Christophe Garcia</i>	
A Neural Network to Retrieve Images from Text Queries	24
<i>David Grangier, Samy Bengio</i>	
Techniques for Still Image Scene Classification and Object Detection ...	35
<i>Ville Viitaniemi, Jorma Laaksonen</i>	
Adaptation of Weighted Fuzzy Programs	45
<i>Alexandros Chortaras, Giorgos Stamou, Andreas Stafylopatis</i>	
Classified Ranking of Semantic Content Filtered Output Using Self-organizing Neural Networks	55
<i>Marios Angelides, Anastasis Sofokleous, Minaz Parmar</i>	
Classifier Fusion: Combination Methods For Semantic Indexing in Video Content	65
<i>Rachid Benmokhtar, Benoit Huet</i>	

Bridging the Semantic Gap in Multimedia Machine Learning Approaches (Special Session)

Retrieval of Multimedia Objects by Combining Semantic Information from Visual and Textual Descriptors	75
<i>Mats Sjöberg, Jorma Laaksonen, Matti Pöllä, Timo Honkela</i>	
A Relevance Feedback Approach for Content Based Image Retrieval Using Gaussian Mixture Models	84
<i>Apostolos Marakakis, Nikolaos Galatsanos, Aristidis Likas, Andreas Stafylopatis</i>	

Video Representation and Retrieval Using Spatio-temporal Descriptors
and Region Relations 94
*Sotirios Chatzis, Anastasios Doulamis, Dimitrios Kosmopoulos,
Theodora Varvarigou*

Bridging the Syntactic and the Semantic Web Search 104
*Georgios Kouzas, Ioannis Anagnostopoulos, Ilias Maglogiannis,
Christos Anagnostopoulos*

Content-Based Coin Retrieval Using Invariant Features and
Self-organizing Maps 113
Nikolaos Vassilas, Christos Skourlas

Signal and Time Series Processing (I)

Learning Time-Series Similarity with a Neural Network by Combining
Similarity Measures 123
Maria Sagrebin, Nils Goerke

Prediction Improvement Via Smooth Component Analysis and Neural
Network Mixing 133
Ryszard Szupiluk, Piotr Wojewnik, Tomasz Zabkowski

Missing Value Estimation for DNA Microarrays with Mutliresolution
Schemes 141
Dimitrios Vogiatzis, Nicolas Tsapatsoulis

Applying REC Analysis to Ensembles of Sigma-Point Kalman Filters ... 151
Aloísio Carlos de Pina, Gerson Zaverucha

Analysis of Fast Input Selection: Application in Time Series
Prediction 161
Jarkko Tikka, Amaury Lendasse, Jaakko Hollmén

A Linguistic Approach to a Human-Consistent Summarization of Time
Series Using a SOM Learned with a LVQ-Type Algorithm 171
Janusz Kacprzyk, Anna Wilbik, Sławomir Zadrozny

Signal and Time Series Processing (II)

Long-Term Prediction of Time Series Using State-Space Models 181
Elia Läätiäinen, Amaury Lendasse

Time Series Prediction Using Fuzzy Wavelet Neural Network Model 191
Rahib H. Abiyev

OFDM Channel Equalization Based on Radial Basis Function Networks	201
<i>Giuseppina Moffa</i>	
A Quasi-stochastic Gradient Algorithm for Variance-Dependent Component Analysis	211
<i>Aapo Hyvärinen, Shohei Shimizu</i>	
Two ICA Algorithms Applied to BSS in Non-destructive Vibratory Tests	221
<i>Juan-José González de-la-Rosa, Carlos G. Puntonet, Rosa Piotrkowski, I. Lloret, Juan-Manuel Górriz</i>	
Reference-Based Extraction of Phase Synchronous Components	230
<i>Jan-Hendrik Schleimer, Ricardo Vigário</i>	

Data Analysis (I)

Analytic Solution of Hierarchical Variational Bayes in Linear Inverse Problem	240
<i>Shinichi Nakajima, Sumio Watanabe</i>	
Nonnegative Matrix Factorization for Motor Imagery EEG Classification	250
<i>Hyekyoung Lee, Andrzej Cichocki, Seungjin Choi</i>	
Local Factor Analysis with Automatic Model Selection: A Comparative Study and Digits Recognition Application	260
<i>Lei Shi, Lei Xu</i>	
Interpolating Support Information Granules	270
<i>Bruno Apolloni, Simone Bassis, Dario Malchiodi, Witold Pedrycz</i>	
Feature Selection Based on Kernel Discriminant Analysis	282
<i>Masamichi Ashihara, Shigeo Abe</i>	
Local Selection of Model Parameters in Probability Density Function Estimation	292
<i>Ezequiel López-Rubio, Juan Miguel Ortiz-de-Lazcano-Lobato, Domingo López-Rodríguez, Enrique Mérida-Casermeyro, María del Carmen Vargas-González</i>	
The Sphere-Concatenate Method for Gaussian Process Canonical Correlation Analysis	302
<i>Pei Ling Lai, Gayle Leen, Colin Fyfe</i>	

Theory of a Probabilistic-Dependence Measure of Dissimilarity Among
Multiple Clusters 311
Kazunori Iwata, Akira Hayashi

Kernel PCA as a Visualization Tools for Clusters Identifications 321
Alissar Nasser, Denis Hamad, Chaiban Nasr

Data Analysis (II)

A Fast Fixed-Point Algorithm for Two-Class Discriminative Feature
Extraction 330
Zhirong Yang, Jorma Laaksonen

Feature Extraction with Weighted Samples Based on Independent
Component Analysis 340
Nojun Kwak

Discriminant Analysis by a Neural Network with Mahalanobis
Distance 350
Yoshifusa Ito, Cidambi Srinivasan, Hiroyuki Izumi

Assessment of an Unsupervised Feature Selection Method for
Generative Topographic Mapping 361
Alfredo Vellido

A Model Selection Method Based on Bound of Learning Coefficient 371
*Keisuke Yamazaki, Kenji Nagata, Sumio Watanabe,
Klaus-Robert Müller*

Pattern Recognition

Sequential Learning with LS-SVM for Large-Scale Data Sets 381
Tobias Jung, Daniel Polani

A Nearest Features Classifier Using a Self-organizing Map for Memory
Base Evaluation 391
Christos Pateritsas, Andreas Stafylopatis

A Multisensor Fusion System for the Detection of Plant Viruses
by Combining Artificial Neural Networks..... 401
*Dimitrios Frossyniotis, Yannis Anthopoulos, Spiros Kintzios,
Antonis Perdikaris, Constantine P. Yialouris*

A Novel Connectionist-Oriented Feature Normalization Technique..... 410
Edmondo Trentin

An Evolutionary Approach to Automatic Kernel Construction	417
<i>Tom Howley, Michael G. Madden</i>	
A Leave-K-Out Cross-Validation Scheme for Unsupervised Kernel Regression	427
<i>Stefan Klanke, Helge Ritter</i>	
Neural Network Clustering Based on Distances Between Objects	437
<i>Leonid B. Litinskii, Dmitry E. Romanov</i>	
Rotation-Invariant Pattern Recognition: A Procedure Slightly Inspired on Olfactory System and Based on Kohonen Network	444
<i>Marcelo B. Palermo, Luiz H.A. Monteiro</i>	
Pattern Classification Using Composite Features	451
<i>Chunghoon Kim, Chong-Ho Choi</i>	
Visual Attention Algorithms and Architectures for Perceptual Understanding and Video Coding (Special Session)	
Towards a Control Theory of Attention	461
<i>John G. Taylor</i>	
Localization of Attended Multi-feature Stimuli: Tracing Back Feed-Forward Activation Using Localized Saliency Computations	471
<i>John K. Tsotsos</i>	
An Attention Based Similarity Measure for Colour Images	481
<i>Li Chen, Fred W.M. Stentiford</i>	
Learning by Integrating Information Within and Across Fixations	488
<i>Predrag Neskovic, Liang Wu, Leon N Cooper</i>	
Feature Conjunctions in Visual Search	498
<i>Antonio J. Rodríguez-Sánchez, Evgueni Simine, John K. Tsotsos</i>	
A Biologically Motivated System for Unconstrained Online Learning of Visual Objects	508
<i>Heiko Wersing, Stephan Kirstein, Michael Götting, Holger Brandl, Mark Dunn, Inna Mikhailova, Christian Goerick, Jochen Steil, Helge Ritter, Edgar Körner</i>	
Second-Order (Non-Fourier) Attention-Based Face Detection	518
<i>Albert L. Rothenstein, Andrei Zaharescu, John K. Tsotsos</i>	