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Neural Information Processing

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Volume Editors

Tingwen Huang
Texas A&M University at Qatar, Education City
P.O. Box 23874, Doha, Qatar
E-mail: tingwen.huang@qatar.tamu.edu

Zhigang Zeng
Huazhong University of Science and Technology
Department of Control Science and Engineering
1037 Luoyu Road, Wuhan, Hubei 430074, China
E-mail: zgzeng@gmail.com

Chuandong Li
Chongqing University, College of Computer Science
174 Shazhengjie Street, Chongqing 400044, China
E-mail: licd@cqu.edu.cn

Chi Sing Leung
City University of Hong Kong, Department of Electronic Engineering
83 Tat Chee Avenue, Kowloon, Hong Kong, China
E-mail: eeleungc@cityu.edu.hk

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Preface

This volume is part of the five-volume proceedings of the 19th International Conference on Neural Information Processing (ICONIP 2012), which was held in Doha, Qatar, during November 12–15, 2012. ICONIP is the annual conference of the Asia Pacific Neural Network Assembly (APNNA). This series of conferences has been held annually since 1994 and has become one of the premier international conferences in the areas of neural networks.

Over the past few decades, the neural information processing community has witnessed tremendous efforts and developments from all aspects of neural information processing research. These include theoretical foundations, architectures and network organizations, modeling and simulation, empirical study, as well as a wide range of applications across different domains. Recent developments in science and technology, including neuroscience, computer science, cognitive science, nano-technologies, and engineering design, among others, have provided significant new understandings and technological solutions to move neural information processing research toward the development of complex, large-scale, and networked brain-like intelligent systems. This long-term goal can only be achieved with continuous efforts from the community to seriously investigate different issues of the neural information processing and related fields. To this end, ICONIP 2012 provided a powerful platform for the community to share their latest research results, to discuss critical future research directions, to stimulate innovative research ideas, as well as to facilitate multidisciplinary collaborations worldwide.

ICONIP 2012 received tremendous submissions authored by scholars coming from 60 countries and regions across six continents. Based on a rigorous peer-review process, where each submission was evaluated by at least two reviewers, about 400 high-quality papers were selected for publication in the prestigious series of *Lecture Notes in Computer Science*. These papers cover all major topics of theoretical research, empirical study, and applications of neural information processing research. In addition to the contributed papers, the ICONIP 2012 technical program included 14 keynote and plenary speeches by Majid Ahmadi (University of Windsor, Canada), Shun-ichi Amari (RIKEN Brain Science Institute, Japan), Guanrong Chen (City University of Hong Kong, Hong Kong), Leon Chua (University of California at Berkeley, USA), Robert Desimone (Massachusetts Institute of Technology, USA), Stephen Grossberg (Boston University, USA), Michael I. Jordan (University of California at Berkeley, USA), Nikola Kasabov (Auckland University of Technology, New Zealand), Juergen Kurths (University of Potsdam, Germany), Erkki Oja (Aalto University, Finland), Marios M. Polycarpou (University of Cyprus, Cyprus), Leszek Rutkowski (Technical University of Czestochowa, Poland), Ron Sun (Rensselaer Polytechnic Institute, USA), and Jun Wang (Chinese University of Hong Kong, Hong Kong). The

ICONIP technical program included two panels. One was on "Challenges and Promises in Computational Intelligence" with panelists: Shun-ichi Amari, Leon Chua, Robert Desimone, Stephen Grossberg and Michael I. Jordan; the other one was on "How to Write Better Technical Papers for International Journals in Computational Intelligence" with panelists: Derong Liu (University of Illinois of Chicago, USA), Michel Verleysen (Université catholique de Louvain, Belgium), Deliang Wang (Ohio State University, USA), and Xin Yao (University of Birmingham, UK). The ICONIP 2012 technical program was enriched by 16 special sessions and "The 5$^{\text{th}}$ International Workshop on Data Mining and Cybersecurity." We highly appreciate all the organizers of special sessions and workshop for their tremendous efforts and strong support.

Our conference would not have been successful without the generous patronage of our sponsors. We are most grateful to our platinum sponsor: *United Development Company PSC (UDC)*; gold sponsors: *Qatar Petrochemical Company, ExxonMobil* and *Qatar Petroleum*; organizers/sponsors: *Texas A&M University at Qatar* and *Asia Pacific Neural Network Assembly*. We would also like to express our sincere thanks to the IEEE Computational Intelligence Society, International Neural Network Society, European Neural Network Society, and Japanese Neural Network Society for technical sponsorship.

We would also like to sincerely thank Honorary Conference Chair Mark Weichold, Honorary Chair of the Advisory Committee Shun-ichi Amari, the members of the Advisory Committee, the APNNA Governing Board and past presidents for their guidance, the Organizing Chairs Rudolph Lorentz and Khalid Qaraqe, the members of the Organizing Committee, Special Sessions Chairs, Publication Committee and Publicity Chairs, for all their great efforts and time in organizing such an event. We would also like to take this opportunity to express our deepest gratitude to the members of the Program Committee and all reviewers for their professional review of the papers. Their expertise guaranteed the high quality of the technical program of the ICONIP 2012!

We would like to express our special thanks to Web manager Wenwen Shen for her tremendous efforts in maintaining the conference website, the publication team including Gang Bao, Huanqiong Chen, Ling Chen, Dai Yu, Xing He, Junjian Huang, Chaobei Li, Cheng Lian, Jiangtao Qi, Wenwen Shen, Shiping Wen, Ailong Wu, Jian Xiao, Wei Yao, and Wei Zhang for spending much time to check the accepted papers, and the logistics team including Hala El-Dakak, Rob Hinton, Geeta Megchiani, Carol Nader, and Susan Rozario for their strong support in many aspects of the local logistics.

Furthermore, we would also like to thank Springer for publishing the proceedings in the prestigious series of *Lecture Notes in Computer Science*. We would, moreover, like to express our heartfelt appreciation to the keynote, plenary, panel, and invited speakers for their vision and discussions on the latest

research developments in the field as well as critical future research directions, opportunities, and challenges. Finally, we would like to thank all the speakers, authors, and participants for their great contribution and support that made ICONIP 2012 a huge success.

November 2012

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Table of Contents – Part IV

Session 4: Applications

Neural Network Learning for Blind Source Separation with Application in Dam Safety Monitoring 1
Theodor Dan Popescu

Improved BTC Algorithm for Gray Scale Images Using K-Means Quad Clustering 9
Jayamol Mathews, Madhu S. Nair, and Liza Jo

Optimization of a Neural Network for Computer Vision Based Fall Detection with Fixed-Point Arithmetic 18
Christoph Sulzbachner, Martin Humenberger, Ágoston Srp, and Ferenc Vajda

Customer Relationship Management Using Partial Focus Feature Reduction 27
Yan Tu and Zijiang Yang

An Automated System for the Grading of Diabetic Maculopathy in Fundus Images 36
Muhammad Usman Akram, Mahmood Akhtar, and M. Younus Javed

An Iterative Method for a Class of Generalized Global Dynamical System Involving Fuzzy Mappings in Hilbert Spaces 44
Yun-zhi Zou, Xin-kun Wu, Wen-bin Zhang, and Chang-yin Sun

Estimation of Missing Precipitation Records Using Modular Artificial Neural Networks 52
Jesada Kajornrit, Kok Wai Wong, and Chun Che Fung

Office Employees Authentication Based on E-exam Techniques 60
Ameer H. Morad

Obtaining Single Document Summaries Using Latent Dirichlet Allocation 66
Karthik Nagesh and M. Narasimha Murty

Object Recognition Using Sparse Representation of Overcomplete Dictionary 75
Chu-Kiong Loo and Ali Memariani

PEAQ Compatible Audio Quality Estimation Using Computational Auditory Model 83
Jia Zheng, Mengyao Zhu, Junwei He, and Xiaoqing Yu

A System for Offline Character Recognition Using Auto-encoder Networks 91
Sagar Dewan and Srinivasa Chakravarthy

TrafficS: A Behavior-Based Network Traffic Classification Benchmark System with Traffic Sampling Functionality 100
Xiaoyan Yan, Bo Liang, Tao Ban, Shanqing Guo, and Liming Wang

Harmony Search with Multi-Parent Crossover for Solving IEEE-CEC2011 Competition Problems 108
Iyad Abu Doush

New Intelligent Interactive Automated Systems for Design of Machine Elements and Assemblies 115
Wojciech Kacalak and Maciej Majewski

Rough Sets and Neural Networks Based Aerial Images Segmentation Method 123
Xiao Fu, Jin Liu, Haopeng Wang, Bin Zhang, and Rui Gao

Frontal Cortex Neural Activities Shift Cognitive Resources Away from Facial Activities in Real-Time Problem Solving 132
Shen Ren, Michael Barlow, and Hussein A. Abbass

Implement Real-Time Polyphonic Pitch Detection and Feedback System for the Melodic Instrument Player 140
Geon-min Kim, Chang-hyun Kim, and Soo-young Lee

Classification of Interview Sheets Using Self-Organizing Maps for Determination of Ophthalmic Examinations 148
Naotake Kamiura, Ayumu Saitoh, Teijiro Isokawa, Nobuyuki Matsui, and Hitoshi Tabuchi

Sound-Based Ranging System in Greenhouse Environment with Multipath Effect Compensation Using Artificial Neural Network 156
Slamet Widodo, Tomoo Shiigi, Naing Min Than, Yuichi Ogawa, and Naoshi Kondo

Multimedia Educational Content for Saudi Deaf 164
Yahya O. Mohamed Elhadj

Grasping Region Identification in Novel Objects Using Microsoft Kinect 172
Akshara Rai, Prem Kumar Patchaikani, Mridul Agarwal, Rohit Gupta, and Laxmidhar Behera

Annotating Words Using WordNet Semantic Glosses 180
Julian Szymański and Włodzisław Duch

Identification of Moving Vehicle Trajectory Using Manifold Learning ... 188
Giyoung Lee, Rammohan Mallipeddi, and Minho Lee

Approaches for the Detection of the Keywords in Spoken Documents Application for the Field of E-Libraries ... 196
Bendib Issam and Laouar Mohamed Ridda

Fast Affine Invariant Shape Matching from 3D Images Based on the Distance Association Map and the Genetic Algorithm ... 204
Peter Wai-Ming Tsang, W.C. Situ, Chi Sing Leung, and Kai-Tat Ng

Sparse Gradient-Based Direct Policy Search ... 212
Nataliya Sokolovska

Application of Sampling Theory to Forecast Ozone by Neural Network ... 222
Armando Pelliccioni and Rossana Cotroneo

Application of Genetic Neural Networks for Modeling of Active Devices ... 231
Anwar Jarndal

Displacement Prediction Model of Landslide Based on Ensemble of Extreme Learning Machine ... 240
Cheng Lian, Zhigang Zeng, Wei Yao, and Huiming Tang

Effective Handwriting Recognition System Using Geometrical Character Analysis Algorithms ... 248
Wojciech Kacalak and Maciej Majewski

The Use of ASM Feature Extraction and Machine Learning for the Discrimination of Members of the Fish Ectoparasite Genus Gyrodactylus ... 256
Rozniza Ali, Amir Hussain, James E. Bron, and Andrew P. Shinn

DBNs-BLR (MCMC) -GAs-KNN: A Novel Framework of Hybrid System for Thalassemia Expert System ... 264
Patcharaporn Paokanta

Hybrid Approach for Diagnosing Thyroid, Hepatitis, and Breast Cancer Based on Correlation Based Feature Selection and Naïve Bayes ... 272
Mohammad Ashraf, Girija Chetty, Dat Tran, and Dharmendra Sharma

Data Discretization Using the Extreme Learning Machine Neural Network ... 281
Juan Jesús Carneros, José M. Jerez, Iván Gómez, and Leonardo Franco

Bayesian Variable Selection in Neural Networks for Short-Term Meteorological Prediction 289
Pierrick Bruneau and Laurence Boudet

Integrated Problem Solving Steering Framework on Clash Reconciliation Strategies for University Examination Timetabling Problem 297
J. Joshua Thomas, Ahamad Tajudin Khader, Bahari Belaton, and Choy Chee Ken

A Data Gathering Scheme in Wireless Sensor Networks Using a Spiking Neural Network with Simple Local Information 305
Ikki Fujita, Hidehiro Nakano, and Arata Miyauchi

Utilizing Symbolic Representation in Synergistic Neural Networks Classifier of Control Chart Patterns 313
Kittichai Lavangnananda and Pantharee Sawasdimongkol

Semantic Analysis of FBI News Reports 322
Sarwat Nizamani and Nasrullah Memon

Regularized Signal Deconvolution Based on Hybrid Swarm Intelligence: Application to Neutron Imaging 330
Slami Saadi, Maamar Bettayeb, Abderrezak Guessoum, and M.K. Abdelhafidi

Artificial Bees Colony Optimized Neural Network Model for ECG Signals Classification 339
Slami Saadi, Maamar Bettayeb, Abderrezak Guessoum, and M.K. Abdelhafidi

Single-Trial Multi-channel N170 Estimation Using Linear Discriminant Analysis (LDA) 347
Wee Lih Lee, Tele Tan, Torbjörn Falkmer, and Yee Hong Leung

EEG Based Foot Movement Onset Detection with the Probabilistic Classification Vector Machine 356
Raheleh Mohammadi, Ali Mahloojifar, Huanhuan Chen, and Damien Coyle

Neural Networks Based System for the Supervision of Therapeutic Exercises 364
Sven Nõmm, Alar Kuusik, Sergei Ovsjanski, Ines Malmberg, Marko Parve, and L. Orunurm

Fuzzy Model for Detection and Estimation of the Degree of Autism Spectrum Disorder 372
Wafaa Khazaal Shams, Abdul Wahab, and Uvais A. Qidwai

Detecting Different Tasks Using EEG-Source-Temporal Features 380
Wafaa Khazaal Shams, Abdul Wahab, and Uvais A. Qidwai

Artificial Neural Network Classification Models for Stress in Reading ... 388
Nandita Sharma and Tom Gedeon

Performance Evaluation of TCP and UDP Traffic in IEEE 1451 Compliant Healthcare Infrastructure 396
Junaid Ahsenali Chaudhry, Uvais A. Qidwai, and Mudassar Ahmad

Power and Task Management in Wireless Body Area Network Based Medical Monitoring Systems 404
Robert G. Rittenhouse, Malrey Lee, Junaid Ahsenali Chaudhry, and Uvais A. Qidwai

Feature Salience for Neural Networks: Comparing Algorithms 415
Theodor Heinze, Martin von Löwis, and Andreas Polze

Adaptive Modeling of HRTFs Based on Reinforcement Learning 423
Shuhei Morioka, Isao Nambu, Shohei Yano, Haruhide Hokari, and Yasuhiro Wada

Damage Pattern Recognition of Refractory Materials Based on BP Neural Network 431
Changming Liu, Zhigang Wang, Yourong Li, Xi Li, Gangbing Song, and Jianyi Kong

Robust and Optimum Features for Persian Accent Classification Using Artificial Neural Network 441
Azam Rabiee and Saeed Setayeshi

Identification of Factors Characterising Volatility and Firm-Specific Risk Using Ensemble Classifiers 450
Pascal Khoury and Denise Gorse

Fuzzy Classification-Based Control of Wheelchair Using EEG Data to Assist People with Disabilities 458
Uvais A. Qidwai and Mohamed Shakir

EEG-Based Emotion Recognition in Listening Music by Using Support Vector Machine and Linear Dynamic System 468
Ruo-Nan Duan, Xiao-Wei Wang, and Bao-Liang Lu

Analysis of Genetic Disease Hemophilia B by Using Support Vector Machine 476
Kenji Aoki, Kunihito Yamamori, Makoto Sakamoto, and Hiroshi Furutani

EEG-Based Fatigue Classification by Using Parallel Hidden Markov Model and Pattern Classifier Combination 484
Hui Sun and Bao-Liang Lu

A Novel Approach to Protein Structure Prediction Using PCA or LDA Based Extreme Learning Machines 492
Lavneet Singh, Girija Chetty, and Dharmendra Sharma

Hierarchical Parallel PSO-SVM Based Subject-Independent Sleep Apnea Classification 500
Yashar Maali and Adel Al-Jumaily

Air Quality Monitoring and Prediction System Using Machine-to-Machine Platform 508
Abdullah Kadri, Khaled Bashir Shaban, Elias Yaacoub, and Adnan Abu-Dayya

An Extension of the Consensus-Based Bundle Algorithm for Group Dependant Tasks with Equipment Dependencies 518
Simon Hunt, Qinggang Meng, and Chris J. Hinde

From e-Learning to m-Learning: Context-Aware CBR System 528
Henda Ouertani Chorfi, Aise Zülal Sevkli, and Fatiha Bousbahi

Extreme Learning Machines for Intrusion Detection Systems 535
Gilles Paiva M. de Farias, Adriano L.I. de Oliveira, and George G. Cabral

A Self-Organizing Maps Multivariate Spatio-temporal Approach for the Classification of Atmospheric Conditions 544
Kostas Philippopoulos and Despina Deligiorgi

An Online Signature Verification System for Forgery and Disguise Detection 552
Abdelâali Hassaïne and Somaya Al-Maadeed

A Modular Approach to Support the Multidisciplinary Design of Educational Game Experiences 560
Telmo Zarraonandia, Paloma Díaz, and Ignacio Aedo

Touch-Based Mobile Phone Interface Guidelines and Design Recommendations for Elderly People: A Survey of the Literature 568
Muna S. Al-Razgan, Hend S. Al-Khalifa, Mona D. Al-Shahrani, and Hessah H. AlAjmi

A Novel Paradigm for Mining Cell Phenotypes in Multi-tag Bioimages Using a Locality Preserving Nonlinear Embedding 575
Adnan Mujahid Khan, Ahmad Humayun, Shan-e-Ahmad Raza, Michael Khan, and Nasir M. Rajpoot

SNEOM: A Sanger Network Based Extended Over-Sampling Method. Application to Imbalanced Biomedical Datasets 584
José Manuel Martínez-García, Carmen Paz Suárez-Araujo, and Patricio García Báez

Abductive Neural Network Modeling for Hand Recognition Using Geometric Features 593
El-Sayed M. El-Alfy, Radwan E. Abdel-Aal, and Zubair A. Baig

Designing Serious Games for Adult Students with Cognitive Disabilities 603
Javier Torrente, Ángel del Blanco, Pablo Moreno-Ger, and Baltasar Fernández-Manjón

Neural Network Based Approach for Automotive Brake Light Parameter Estimation 611
Antonio Vanderlei Ortega and Ivan Nunes da Silva

A Single Neuron Model for Pattern Classification 619
B. Chandra and K.V. Naresh Babu

Continuous Classification of Spatio-temporal Data Streams Using Liquid State Machines 626
Stefan Schliebs and Doug Hunt

On the Selection of Time-Frequency Features for Improving the Detection and Classification of Newborn EEG Seizure Signals and Other Abnormalities 634
Boualem Boashash and Larbi Boubchir

Turf Grass Irrigation Using Neuro-Fuzzy System 644
Azlinah Mohamed, Nur Fharah Anuar, Sofianita Mutalib, Marina Yusoff, and Shuzlina Abdul-Rahman

A Target-Reaching Controller for Mobile Robots Using Spiking Neural Networks 652
Xiuqing Wang, Zeng-Guang Hou, Feng Lv, Min Tan, and Yongji Wang

Assessing Reliability of Substation Spare Current Transformer System 660
Cristiano G. de Melo, Renata Maria Cardoso R. de Souza, and Liliane R.B. Salgado

Study on Supply Disruption Management of Supply Chain Based on Case-Based Reasoning 668
Zhang Daohai

Global Minimizer of Large Scale Stochastic Rosenbrock Function: Canonical Duality Approach 677
Chaojie Li and David Yang Gao

Study on Landslide Deformation Prediction Based on Recurrent Neural Network under the Function of Rainfall 683
Huangqiong Chen, Zhigang Zeng, and Huiming Tang

Vehicle Image Classification Based on Edge: Features and Distances Comparison 691
Fabrízia Medeiros de S. Matos and Renata Maria Cardoso R. de Souza

Author Index 699