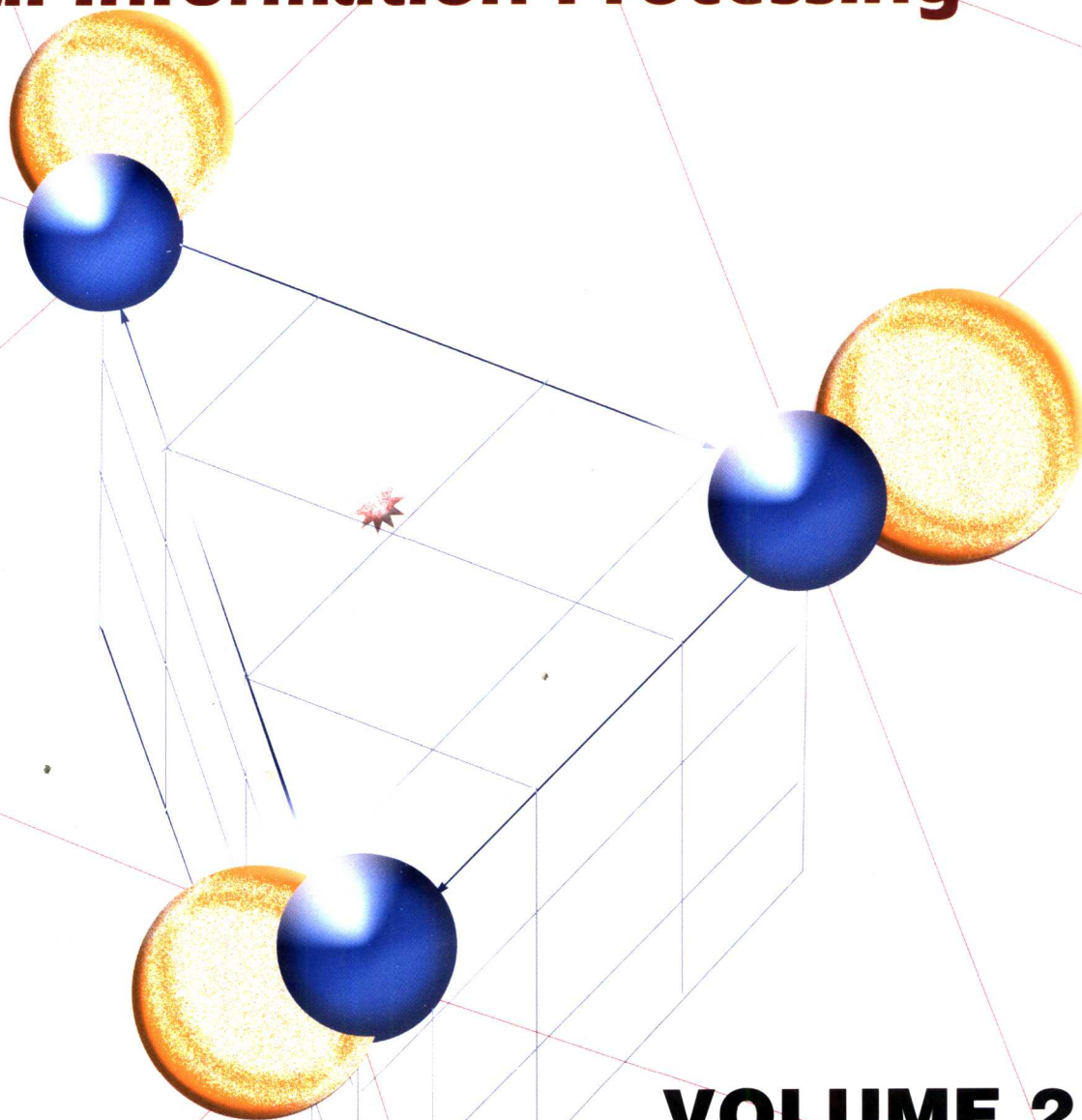


ICONIP'02

Proceedings of the 9th International Conference on Neural Information Processing



VOLUME 2

Lipo Wang,
Jagath C. Rajapakse,
Kunihiko Fukushima,
Soo-Young Lee,
and Xin Yao (Editors)

November 18 - 22, 2002
Orchid Country Club, Singapore



ICONIP'02

Proceedings of the
9th International Conference on Neural
Information Processing

Computational Intelligence for the E-Age

Volume 2

**Lipo Wang, Jagath C. Rajapakse, Kunihiro Fukushima,
Soo-Young Lee, and Xin Yao (Editors)**

November 18 - 22, 2002

Orchid Country Club, Singapore

Proceedings of the 9th International Conference on Neural Information Processing (ICONIP'02)

Abstracting and indexing of the paper is permitted but due credit should be given to the source. Photocopy of an article is permitted for authors and researchers for their own reading and research. Written permission should be obtained from the publishers prior to any prohibited reproduction. Please contact: Conference Management Centre/CCE, Nanyang Technological University, Administration Annex Building, #04-06, 42 Nanyang Avenue, Singapore 639815; Fax: +65 6793 0997.

ISBN: 981-04-7524-1

IEEE Catalog Number: 02EX575

Additional copies of this publication are available from:

IEEE Service Center
445 Hoes Lane
P.O.Box 1331
Piscataway, NJ08855-1331
Tel: +1 732 981-0600
Fax: +1 732 981-9667

<http://shop.ieee.org/store/customer-service@ieee.org>
e-mail: customer-services@ieee.org

Welcome Message from Conference Chairs

On behalf of the Organizing Committee, we welcome you to the 9th International Conference on Neural Information Processing (ICONIP'02), the 4th Asia-Pacific Conference on Simulated Evolution And Learning (SEAL'02), and the 1st International Conference on Fuzzy Systems and Knowledge Discovery (FSKD'02). And for most of you, welcome to Singapore!

ICONIP is the annual conference of the Asia-Pacific Neural Network Assembly. SEAL is a biannual conference on evolutionary computation in the Asia-Pacific region. It is the first time that these two conferences are held jointly at the same venue and at the same time, and it is also the first time that they are held here in Singapore. We are very pleased that both ICONIP'02 and SEAL'02 are among the most successful in their respective serials. The name of the FSKD conference was suggested to us by its Honorary Conference Chair, Professor Lotfi A. Zadeh. It is gratifying to see the extremely encouraging first run of FSKD'02.

ICONIP'02 has attracted 670 submissions. The joint conference has received a total of 1100 submissions from 60 countries in all continents. We have selected 536 high quality papers for ICONIP'02 (852 for the joint conference) based on a thorough and comprehensive review of each and every paper. About 15% of these accepted papers are from special sessions, for which the special session organizers coordinated the reviews. The accepted papers are arranged into 12 parallel oral sessions, plus 1 poster session in each afternoon.

The theme of the conference is "Computational Intelligence for the E-Age". With the proliferation of soft computing applications, there are numerous challenges for both researchers and practitioners in the broad areas of neural information processing, evolutionary computation, fuzzy systems, and knowledge discovery. The joint ICONIP'02-SEAL'02-FSKD'02 aims at providing a common platform to report recent developments, as well as to promote cross-fertilization, in these exciting and yet closely-related areas. The Organizing Committee firmly believes that the joint conference will have a significant impact on the advancement of these important technologies.

The Conference starts off with tutorials and we are fortunate to have several well-known authorities to deal in depth with issues related to the conference theme. More than 100 participants have registered for the tutorial sessions.

We are blessed with the presence of six renowned keynote and plenary speakers. Each of them will address a very topical issue. We are sure you will find their addresses inspiring and insightful.

On behalf of the Organizing Committee, we thank our Guest-of-Honour, Dr Cham Tao Soon, President of Nanyang Technological University, for gracing the Opening Ceremony. We thank Professor Er Meng Hwa, Deputy President, Dean of College of Engineering, and Dean of the School of Electrical and Electronic Engineering, Nanyang Technological University, for his advice, guidance and encouragement given to the Organizing Committee. We are grateful for the technical cooperation from the IEEE Neural Networks Society, the International Neural Network Society, the European Neural Network Society, the SPIE, and the Singapore Neuroscience Association. We would like to thank the generous financial support from our sponsors: Lee Foundation, Singapore Exhibition and Convention Bureau, U.S. Asian Office of Aerospace Research & Development (AOARD), U.S. Army Research Office-Far East (ARO-FE), Novartis Pharmaceuticals, Salford Systems, and CyberSoft.

We thank the members of the Organizing Committee, the International Advisory Board, and the Program Committees for their hard work in the past 18 months, especially the Advisor, Professor Alex Kot, for his extremely valuable suggestions and input throughout.

We also wish to express our heart-felt appreciation to the keynote and plenary speakers, special session organizers, session chairs, reviewers, tutorial speakers, staff members from the NTU Conference Management Center, and student helpers. Special thanks are due to the Support Team Leader, Sophia Kuo, as well as the members of the Support Team, for their most dedicated and enthusiastic efforts.

Last, but definitely the most, thank you all, the authors and participants, for your great contributions that have made this conference possible. It is your very presence here that makes all the hard work worthwhile.

We trust that you will have a rewarding experience at the conference and a pleasant stay in Singapore. You may have noticed that some of the name tags, including ours, are printed on colored papers. This is not to make the rest of you envious, but to identify those whom you can approach for assistance during the conference, should the need arises.

Sincerely,

Lipo Wang
General Chair

Jagath C. Rajapakse
Kunihiko Fukushima
Soo-Young Lee
Program Co-Charis

Xin Yao
Special Sessions Chair

Organizing Committee

Honorary Conference Chair

Shun-ichi Amari, *Japan*

Advisor

Alex C. Kot, *Singapore*

General Chair

Lipo Wang, *Singapore*

Program Co-Chairs

Kunihiko Fukushima, *Japan*

Soo-Young Lee, *Korea*

Jagath C. Rajapakse, *Singapore*

Special Sessions Chair

Xin Yao, *UK*

Finance Chair

Charoensak Charayaphan, *Singapore*

Local Arrangement Chair

Meng Hiot Lim, *Singapore*

Proceedings Chair

Farook Sattar, *Singapore*

Publicity Co-Chairs

Hepu Deng, *Australia*

Chunru Wan, *Singapore*

Li Weigang, *Univ Brazil*

Zili Zhang, *Australia*

Secretary

Olga Sourina, *Singapore*

Sponsorship/Exhibition Chair

Tong Seng Quah, *Singapore*

Tutorial Chair

P. N. Suganthan, *Singapore*

Support Team Leader

Sophia Kuo, *Singapore*

Secretariat

Shirley Soh, *Singapore*

International Advisory Board

Sung-Yang Bang, *Postech, Korea*

Meng Hwa Er, *Nanyang Technological University, Singapore*

David Fogel, *Natural Selections, Inc., USA*

Toshio Fukuda, *Nagoya University, Japan*

A. Galushkin, *Russia*

Tom Gedeon, *Murdoch University, Australia*

Zhenya He, *Southeast University, China*

Mo Jamshidi, *University of New Mexico, USA*

Nikola Kasabov, *University of Otago, New Zealand*

Sun-Yuan Kung, *Princeton University, USA*

Tong Heng Lee, *National University of Singapore, Singapore*

Erkki Oja, *Helsinki University of Technology, Finland*

Nikhil R. Pal, *Indian Statistical Institute, India*

Enrique H. Ruspini, *SRI International, USA*

Harcharan Singh, *Nanyang Technological University, Singapore*

Ah Chung Tsoi, *University of Wollongong, Australia*

Shiro Usui, *Toyohashi University of Technology, Japan*

Lei Xu, *Chinese University of Hong Kong, China*

Benjamin W. Wah, *University of Illinois, USA*

Donald C. Wunsch II, *University of Missouri, USA*

Xindong Wu, *Colorado School of Mines, USA*

Youshou Wu, *Tsinghua University, China*

Yixin Zhong, *Beijing University of Postal Technology, China*

Jacek M. Zurada, *University of Louisville, USA*

Program Committee

- Kazuyuki Aihara, *University of Tokyo, Japan*
Igor Aleksander, *Imperial College of Science
Technology and Medicine, UK*
Abdesselam Bouzerdoun, *Edith Cowan
University, Australia*
Laiwan Chan, *The Chinese Univ. of Hong
Kong, Hong Kong*
Tianping Chen, *Fudan University, China*
Sung-Bae Cho, *Yonsei University, Korea*
Andrzej Cichocki, *Brain Science Institute,
RIKEN, Japan*
Michael Denham, *University of Plymouth, UK*
Włodzisław Duch, *Nicolas Copernicus
University, Poland*
Karl Friston, *Institute of Neurology, UCL, UK*
Jay Giedd, *National Institutes of Health, USA*
Masafumi Hagiwara, *Keio University, Japan*
Azlan Hussain, *University Malaya, Malaysia*
Aapo Hyvarinen, *Helsinki University of
Technology, Finland*
Naohiro Ishii, *Nagoya Institute of
Technology, Japan*
Masumi Ishikawa, *Kyushu Institute of
Technology, Japan*
Arun Jagota, *University of California, USA*
Takeshi Kambara, *University of Electro-
Communications, Japan*
Mohamed Kamel, *University of Waterloo,
Canada*
Samuel Kaski, *Helsinki University of
Technology, Finland*
Okyay Kaynak, *Turkey*
Sanjay Khanna, *National University of
Singapore, Singapore*
Rhee Man Kil, *Division of Applied
Mathematics, KAIST, Korea*
Seunghwan Kim, *Pohang University of
Science & Technology, Korea*
Irwin King, *The Chinese Univ. of Hong Kong,
Hong Kong*
Frithjof Krüggel, *Max-Planck-Institute of
Cognitive Neuroscience, Germany*
Chong Ho Lee, *Inha University, Korea*
Minho Lee, *Kyungpook National University,
Korea*
Te-Won Lee, *University of California, USA*
Wei Ling Lee, *National University of
Singapore, Singapore*
Graham Leedham, *Nanyang Technological
University, Singapore*
Cees van Leeuwen, *Brain Science Institute,
RIKEN, Japan*
Cheng-Yuan Liou, *National Taiwan
University, Taiwan*
Frederic Maire, *Queensland University of
Technology, Australia*
Jacek Mandziuk, *Warsaw University of
Technology, Poland*
Gen Matsumoto, *Brain Science Institute,
RIKEN, Japan*
Evangelia Micheli-Tzanakou, *Rutgers
University, USA*
Takashi Omori, *Hokkaido University, Japan*
Hiok Chai Quek, *Nanyang Technological
University, Singapore*
Asim Roy, *Arizona State University, USA*
V. David Sanchez, *Advanced Computational
Intelligent Systems, USA*
P. Saratchandran, *Nanyang Technological
University, Singapore*
Rudy Setiono, *National University of
Singapore, Singapore*
Amanda Sharkey, *University of Sheffield, UK*
Jang-Kyoo Shin, *Kyungpook National
University, Korea*
Kate A. Smith, *Monash University, Australia*
Samuel Tay, *National University of Singapore,
Singapore*
John Taylor, *King's College London, UK*
Vladimir I. Vasilyev, *Ufa State Aviation
Technical University, Russia*
Brijesh Verma, *Griffith University-Gold Coast
Campus, Australia*
Jun Wang, *The Chinese University of Hong
Kong, Hong Kong*
Patrick Wong, *The University of New South
Wales, Australia*
Hiroo Yonezu, *Toyohashi University of
Technology, Japan*
Shuji Yoshizawa, *Saitama University, Japan*
Yanqing Zhang, *Georgia State University,
USA*

Reviewers

Abdul Wahab
Ajith Abraham
Alex Tay
Alexander Boukalov
Amitava Datta
Andreas Ioannides
Aniko Ekart
Arijit Laha
Arjuna Balasuriya
Arnie Azcarraga
Arun Jagata
Ashish Ghosh
Authur Tsai
Bala Srinivasan
CL Tan
Deepu Rajan
Edmond Prakash
Gao Yansheng
Gavin Dawe
Geok See Ng
Guozhu Dong
Hussain Abbas
Jagdish Patra
Jinming Li
Jinyan Li
Keith Chan
Kenji Doya
Kinchoong Yow
Krzysztof Siwek
Lei Yan
Lihui Chen
Liming Zhang

Limsoon Wong
Lipo Wang
Liqing Zhang
Marcelo Ang
Marwan Jabri
Masumi Ishikawa
Maylor Leung
Michel Pasquier
Michelle Liou
Muthu Palaniswami
Narandra Chaudhari
Ng Kong
Noel Sharkey
Omandi Amos
Pando Georgiev
Peter Whigham
Phillip Chen
Ponnathurai Suganthan
PTH Wong
Qi Tian
Raman Yasdi
Reda Gharieb
Ryotaro Kamimura
Saman Abeysekera
Samu Ng
Sardha Wijesoma
Sathiya Keerthi
Seekiong Ng
Seong-Wan Lee
Seungjin Choi
Shigeo Abe
Si Wu

Srimanta Pal
Stuart Perry
Sukumar Chakraborty
Susan Liow
Susanto Rahardja
Takeshi Aihara
Tatjen Cham
Thambi Srikanthan
Tomasz Rutkowski
Tuan Pham
Udantha Abeyratna
Ujjwal Bhattacharya
Vladimir Brusica
Vladimir Bajic
Wee Leow
Wei Lu
Wieslaw Nowinski
WY Ong
WY Yau
Xin Yao
Xuegong Zhang
Yasue Mitsukura
Yin Sitoh
Yiu-ming Cheung
Yoko Yamaguchi
Yong Xue
Yoshizawa Shuji
Yuanqing Li
Yutaka Sakaguchi
Zheru Chi
Zhihong Man

Support Team

Cheong Poh Huat, *Singapore*
Serene Fernandez-Lam Siew Gan, *Singapore*
Hoay-Lim Suat Geok, *Singapore*
Frances Koh-Ho Cheng Fiang, *Singapore*
Clara Lee-Tan Lee Hiang, *Singapore*
Leow-How Seok Lai, *Singapore*

Joseph Lim Puay Chye, *Singapore*
Pamela Ng-Yap Poh Geok, *Singapore*
Eric Tan Ah Chong, *Singapore*
Dorothy Tay-Teo Boon Ping, *Singapore*
Yeo Sung Kheng, *Singapore*
Audrey Yong-Choo Bee Hong, *Singapore*

Special Sessions

Organizers	Topics
Andries Engelbrecht, <i>University of Pretoria, South Africa</i>	Trends in Global Optimization
Nikola Kasabov, <i>University of Otago, New Zealand</i>	Intelligent System in Bioinformatics
Cees van Leeuwen, <i>RIKEN BSI, Japan</i>	Multi-stability, Perceptual Ambiguity, and the Brain
Chih-Jen Lin, <i>National Taiwan University, Taiwan</i> ; S. Sathya Keerthi, <i>National University of Singapore, Singapore</i>	Support Vector Machines and Kernel Methods
Jacek Mandziuk, <i>Warsaw University of Technology, Poland</i>	Neural Networks for Time Series Predictions
Tohru Nitta, <i>National Institute of Advanced Industrial Science and Technology, Japan</i>	Complex-valued Neural Networks
Jagath C. Rajapakse, <i>Nanyang Technological University, Singapore</i> , Frithjof Kruggel, <i>Max-Planck-Institute of Cognitive Neuroscience, Germany</i> , Karl J. Friston, <i>University College London, UK</i>	Brain Imaging
Shiro Usui, <i>Toyohashi Univ. of Technology / RIKEN BSI, Japan</i> , Soo-Young Lee, <i>KAIST, Korea</i> , Vijayalakshmi Ravindranath, <i>NBRC, India</i>	Neuroinformatics Researches in Asian and Pan-Pacific
Jun Wang, <i>Chinese University of Hong Kong, China</i>	Neural Networks for Control Applications
Xufa Wang, <i>Univeristy of Science and Technology of China, China</i>	Artificial Immune Systems and their Applications

Contents

Volume 2

TuePmRm5Ss2: Learning Algorithms VI

Chair(s): Donald Wunsch (University of Missouri-Rolla, USA); Felipe M. G. Franca (COPPE UFRJ, Brazil)

Large Scale Traveling Salesman Problem Via Neural Network Divide and Conquer (#2025)	533
<i>Sam Mulder and Donald Wunsch</i>	
Validating An Unsupervised Weightless Perceptron (#2027)	537
<i>Iuri Wickert and Felipe M. G. Franca</i>	
An Application of a Progressive Neural Network Technique in the Identification of Suspension Properties of Tracked Vehicles (#1658)	542
<i>Shengji Yao and Daolin Xu</i>	
An Evaluation of Constructive Algorithms for Recurrent Networks on Multi-Step-Ahead Prediction (#2019)	547
<i>Romuald Bone and Michel Crucianu</i>	
Training of Support Vector Regressors Based on the Steepest Ascent Method (#1050)	552
<i>Youichi Hirokawa and Shigeo Abe</i>	
Improvement of Wavelet Neural Network Hybrid Systems Performance by Optimisation of Two Types of Learning Algorithms. (#1588)	556
<i>Ewaryst Tkacz, Pawel Kostka, Dariusz Komorowski, Tadeusz Domider and Andrzej Wrzesniowski</i>	

TuePmRm6Ss2: Neurodynamics and Spiking Neurons II

Chair(s): Hiroyuki Torikai (Hosei University, Japan); Osamu Araki (Tokyo University of Science, Japan)

A Quantized Chaotic Spiking Neuron and CDMA Coding (#1517)	562
<i>Ryouhei Furumachi, Hiroyuki Torikai and Toshimichi Saito</i>	
Relationship Between Spike Irregularity and Neural Network Dynamics (#1539)	566
<i>Osamu Araki and Kazuyuki Aihara</i>	
Chaotic Pulse-Coupled Neural Network as a Model of Synchronization and Desynchronization in Cortex (#1363)	571
<i>Yutaka Yamaguchi, Kosei Ishimura and Mitsuo Wada</i>	
Thalamic Circuitry Model Based on Modified "Integrate-And-Fire Neurons" (#1082)	576
<i>Ruben Tikidji - Hamburyan</i>	
Pulsed Para-Neural Network (PPNN) Synthesis in a 3-D Cellular Automata Space (#1083)	581
<i>Andrzej Buller, Hendrik Eeckhaut and Michal Joachimczak</i>	
Deterministic SR Phenomena in Autoassociative Chaotic Neural Networks (#1973)	585
<i>Haruhiko Nishimura, Naofumi Katada and Kazuyuki Aihara</i>	

TuePmRm7Ss2: Special Session on Intelligent Systems in Bioinformatics

Chair(s): Nikola Kasabov (University of Otago, New Zealand)

Evolving Connectionist Systems for Adaptive Learning and Knowledge Discovery: Methods, Tools, Applications (Invited) (#2254)	590
<i>Nikola Kasabov</i>	
A Method for Modelling Genetic Regulatory Networks by Using Evolving Connectionist Systems and Microarray Gene Expression Data (#2257)	596
<i>Nikola Kasabov and Dimitar Dimitrov</i>	
GA-Parameter Optimisation of Evolving Connectionist Systems for Classification and a Case Study from Bioinformatics (#2256)	602
<i>Nikola Kasabov and Qun Song</i>	
Identification of Dental Bacteria Using Statistical and Neural Approaches (#1429)	606
<i>Chaw Koh Yong, Choo Min Lim, Mark Plumbley, David Beighton and Ross Davidson</i>	
Genetic Approach to Biosequence Alignment (GABA) (#2224)	611
<i>Jagath Rajapakse and Ibraheem Faleel</i>	
Prediction of Protein Secondary Structure Using Bayesian Method and Support Vector Machines (#2223)	616
<i>Minh Nguyen and Jagath Rajapakse</i>	

TuePmRm13Ss2: Pattern Recognition I

Chair(s): Kunihiro Fukushima (Tokyo University of Technology, Japan)

Mongolian Character Recognition Using Multilayer Perceptron(MLP) (#1749)	621
<i>Batsaikhan Osorkhuu and Singh Yashwant Prasad</i>	
Detection and Recognition of Road Signs Using Simple Layered Neural Networks (#1886)	626
<i>Hirofumi Ohara, Ikuko Nishikawa, Shigeto Miki and Noboru Yabuki</i>	
A System for Identifying Writer from Thai Handwriting Image (#1466)	631
<i>Jantra U-Seng and Thitipong Tanprasert</i>	
Signature Verification Using ART-2 Neural Network (#1454)	636
<i>Pavel Mautner, Ondrej Rohlik, Vaclav Matousek and Juergen Kempf</i>	
Radar Target Feature Extraction by Wavelet Transform and KCN (#1346)	640
<i>Wang Xiao-Dan and Wang Ji-Qin</i>	
Drift ICE Recognition Using Remote Sensing Data by Neural Networks (#1325)	645
<i>Taketsugu Nagao, Yasue Mitsukura, Minoru Fukumi and Norio Akamatsu</i>	

TuePmRm14Ss2: Face Recognition

Chair(s): Minoru Fukumi (University of Tokushima, Japan)

True Smile Recognition System Using Neural Networks (#1384)	650
<i>Miyoko Nakano, Yasue Mitsukura, Minoru Fukumi and Norio Akamatsu</i>	
Face Detection and Emotional Extraction System Using Double Structure Neural Networks (#1378)	655
<i>Yasue Mitsukura, Minoru Fukumi and Norio Akamatsu</i>	
Convolutional Spiking Neural Network Model for Robust Face Detection (#1123)	660
<i>Masakazu Matsugu, Katsuhiko Mori, Mie Ishii and Yusuke Mitarai</i>	
SFS Based Neural Algorithm for Robust 3D Face Shape Recovery (#1774)	665
<i>Youwei Yuan, Lamei Yan and Deris M. Mat</i>	
Unsupervised Learning for Modularized View-Based Face Detection System (#1389)	670
<i>Hitoshi Ikeda, Noriji Kato, Hirotsugu Kashimura and Masaaki Shimizu</i>	

TuePmRm15Ss2: Vision and Robotics

Chair(s): Takeshi Nishida (Kyushu Institute of Technology, Japan)

A Neural Network Approach to Color Image Classification (#1319)	675
<i>Masayuki Shinmoto, Yasue Mitsukura, Minoru Fukumi and Norio Akamatsu</i>	
Focusing on Soft-Computing Techniques to Model the Role of Context in Determining Colours (#1995)	680
<i>Ema Denby</i>	
A Flying Object Using Hardware Implemented Vision Processing and Motor Control System with Adaptive Neural Network (#1119)	685
<i>Hitoshi Yamada, Johane Takeuchi, Gen Matsumoto and Michinori Ichikawa</i>	
Biologically Motivated GAZE Control in a Cluttered Real Image (#1431)	691
<i>Kyungjoo Cheoi and Yillbyung Lee</i>	
Feature Extraction of Wild Grass by Competitive Neural Nets (#1270)	696
<i>Takeshi Nishida, Shuichi Kurogi and Tomonari Kitamori</i>	
A Neural Network Based Localization from Distorted Image in Omni-Directional Catadioptric Vision System (#1276)	701
<i>Tang Zhe, Sng Hong Lian and Sun Zengqi</i>	

TuePmRm16Ss2: Speech and Natural Language Processing

Chair(s): Heui-Seok Lim (CheonAn University, North Korea)

An Efficient Decomposition of Human-Written Summary Sentence (#1905)	705
<i>Minh Nguyen Le and Susumu Horiguchi</i>	
Low Power Design Using Architecture and Circuit Level Approaches (#1418)	711
<i>Dong-Sun Kim, Jin-Tae Kim, Ki-Won Kwon and Duck-Jin Chung</i>	
Important Prosody Characteristics for Spontaneous Speech Recognition (#1821)	717
<i>Jana Kleckova, Jana Krutisova, Vaclav Matousek and Jana Schwarz</i>	
Application of Neural Networks to Braille Transcription (#1284)	722
<i>Katsuhiko Ootsuka, Satoru Kishida and Toru Watanabe</i>	
Segmentation of Continuous Speech Using Acoustic-Phonetic Parameters and Statistical Learning (#1910)	726
<i>Amit Juneja and Carol Espy-Wilson</i>	
An Improved KNN Learning Based Korean Text Classifier with Heuristic Information (#1893)	731
<i>Heui-Seok Lim</i>	
An Experimental Comparison of Recurrent Neural Network for Natural Language Production (#1298)	736
<i>Hayato Nakagama and Shigeru Tanaka</i>	
Dynamic Cell Assemblies and Vowel Sound Categorization (#1060)	740
<i>Osamu Hoshino, Kouichi Mitsunaga, Masayuki Miyamoto and Kazuharu Kuroiwa</i>	

TuePmRm17Ss2: Biomedical Applications I

Chair(s): Jagath Rajapakse (Nanyang Technological University, Singapore)

PCA-Based Linear Dynamical Systems for Multichannel EEG Classification (#2010)	745
<i>Hyekyoung Lee and Seungjin Choi</i>	

Recognition of EMG Signal Patterns by Neural Networks (#1323)	750
<i>Fuji Matsumura, Yasue Mitsukura, Minoru Fukumi, Norio Akamatsu, Yoshihiro Yamamoto and Kazuhiro Nakaura</i>	
Analysis of DNA Microarray Data Using Self-Organizing Map and Kernel Based Clustering (#1076)	755
<i>Manabu Kotani, Akinobu Sugiyama and Seiichi Ozawa</i>	
Diseases Classification Using Support Vector Machine(SVM) (#2001)	760
<i>Sheng Liu, Qing Song, Wenjie Hu and Aize Cao</i>	
Protein Sequences Classification Using Radial Basis Function (RBF) Neural Networks (#1601)	764
<i>Dianhui Wang, Nung Kion Lee, Tharam S. Dillon and Nick J. Hoogenraad</i>	

TuePmRm18Ss2: Applications I

Chair(s): Masumi Ishikawa (Kyushu Institute of Technology, Japan)

Application of Fastica to Pulse Wave (#1304)	769
<i>T. Aoyagi, H. Tokutaka, K. Fujimura and Y. Maniwa</i>	
Air Quality Data Remediation by Means of ANN (#1906)	773
<i>Giovanni Latini, Luca Magnaterra, Giorgio Passerini and Simone Tascini</i>	
Constructing Analysis Systems with the Self-Organizing Map Based on Web Technology (#1124)	778
<i>Y. Ikeda, H. Tokutaka, K. Fujimura and Y. Maniwa</i>	
The Combination of Neural Networks and Genetic Algorithm for Fast and Flexible Wide Nulling in Digital Beamforming (#1719)	782
<i>Yan Wang and Yilong Lu</i>	
Economic States on Neuronic Maps (#1305)	787
<i>Cheng-Yuan Liou and Yen-Ting Kuo</i>	
Speckle Reduction Using Wiener Filtering in Wavelet Domain (#1787)	792
<i>Yuttapong Rangsanseri and Walailak Prasongsook</i>	

TuePmRm23Ss2: Biomedical Applications II

Chair(s): Jagath Rajapakse (Nanyang Technological University, Singapore)

Fuzzy Inference Based Augmented Reality in Mr Cholangiography Images (#1834)	796
<i>Chihiro Yasuba, Syoji Kobashi, Katsuya Kondo, Yutaka Hata, Seturo Imawaki and Makoto Ishikawa</i>	
Phase Equation Model for the Transition Between Position Matching to Rhythm Matching in Hand Tracking Task (#1548)	801
<i>Fumihiko Ishida, Yoshiki Kuramoto and Yasuji Sawada</i>	
DNA Microarray Data Clustering Using Growing Self Organizing Networks (#1209)	805
<i>Kim Jackson and Irena Koprinska</i>	
Overian Cancer Classification with Missing Data (#1948)	809
<i>Christian Renz, Jagath Rajapakse, Khalil Razvi and Stephen Liang</i>	

TuePmRm24Ss2: Applications II

Chair(s): Masumi Ishikawa (Kyushu Institute of Technology, Japan)

The Hybrid Method for Determining An Adaptive Step Size of the Unknown System Identification Using Genetic Algorithm and Least Mean Square Algorithm (#1549)	814
<i>Heungsik Kim, Taekjoo Lee, Dongsoon Kim and Duckjin Chung</i>	
Interpretation of Real Data by Static Inverse Optimization with Quadratic Constraints (#1752)	819
<i>Hong Zhang and Masumi Ishikawa</i>	
State-of-Charge (SOC) Estimation of High Power NI-MH Rechargeable Battery with Artificial Neural Network (#1996)	824
<i>Chenghui Cai, Dong Du, Zhiyu Liu and Jingtian Ge</i>	
Modeling of Low Nickel-Chromium Steels by Using Back-Propagation Neural Networks (#2034) ...	829
<i>N S Reddy, Krishnaiah Jallu, Y. Kiran Kumar and Narendra N Acharya</i>	
Self-Organization of a Sound Source Localization Robot by Perceptual Cycle (#1087)	834
<i>Hiromichi Nakashima, Toshiharu Mukai and Noboru Ohnishi</i>	
Identification of Wafer Defect Clusters Using a Self-Organizing Multilayer Perceptron (#1020)	839
<i>Chenn-Jung Huang</i>	
A Neural Network Model for Analyzing Vibration Waveform of Impact Sound (#1385)	844
<i>Kenji Hosoya, Takehiko Ogawa, Hajime Kanada and Kiyomi Mori</i>	

NAP-ICONIP : ICONIP'02 Papers not Presented at the Conference but Included in the Proceedings

Chair(s) : Lipo Wang (Nanyang Technological University, Singapore)

An Adaptive Higher-Order Neural Networks (AHONN) and Its Approximation Capabilities (#1046)	848
<i>Shuxiang Xu and Ming Zhang</i>	
Towards Stochastic Conjugate Gradient Methods (#1120)	853
<i>Nicol N. Schraudolph and Thore Graepel</i>	
Research about Holographic Relation and Topological Structure for Thinking Process on Brain and Artificial Intelligence System (#1159)	857
<i>Jiaxiang Bi</i>	
Discriminative Learning and Informative Learning in Pattern Recognition (#1162)	862
<i>Xuechuan Wang and Kuldip Paliwal</i>	
Base Optoelectronic Three-Dimentional Technique in Aspect of Neural Computers Build-Up (#1196)	866
<i>Valery Svede-Chvets, Alexander Galushkin, Anatoli Sukhoparov and Vladislav Svede-Chvets</i>	
Fuzzy Mean Point Clustering Neural Network (#1235)	871
<i>Pradeep Patil, Uday Kulkarni and Trimbak Sontakke</i>	
Face Recognition Using Improved Pairwise Coupling Support Vector Machines (#1288)	876
<i>Zeyu Li and Shiwei Tang</i>	
Identifying Scene Illumination Using Genetic Algorithms and Neural Networks (#1332)	881
<i>Stephen Karungaru, Minoru Fukumi and Norio Akamatsu</i>	

Keynote Speeches

Information Geometry of Neural Learning and Belief Propagation	886
<i>Shun-ichi Amari (RIKEN Brain Science Institute, Japan)</i>	
Remembering Alex Fraser and Explorations in Learning without Human Expertise	887
<i>David B. Fogel (Natural Selection, Inc., USA)</i>	

WedAmRm1: Special Session on Support Vector Machines and Kernel Methods Chair(s): Chih-Jen Lin (Taiwan University, Taiwan); S. Sathya Keerthi (National University of Singapore, Singapore)

A New Bayesian Design Method for Support Vector Classification (#2161)	888
<i>Wei Chu, S. Sathya Keerthi and Chong Jin Ong</i>	
Radius Margin Bounds for Support Vector Machines with the RBF Kernel (#2137)	893
<i>Kai-Min Chung, Wei-Chun Kao, Tony Sun, Li-Lun Wang and Chih-Jen Lin</i>	
Support Vector Clustering Through Proximity Graph Modelling (#2114)	898
<i>Jianhua Yang, Vladimir Estivill-Castro and Stephan Chalup</i>	
Multiple Regression Using Support Vector Machines for Recognition of Speech in a Moving Car Environment (#2144)	904
<i>Weifeng Lee, C. Chandra Sekhar, Kazuya Takeda and Fumitada Itakura</i>	
Initial Structure Selection for Neural Networks and Fuzzy Neural Networks Based on Support Vector Regression with Outliers (#2164)	909
<i>Jin Tsong Jeng and Chen Chia Chuang</i>	
Using Support Vector Machines for Stability Region Determination (#2193)	915
<i>Zhenhua Zhang, Chongjin Ong, S. Sathya Keerthi and E.G. Gilbert</i>	
Adaptive Deterministic Annealing for Two Applications: Competing SVR of Switching Dynamics and Travelling Salesman Problems. (#2190)	920
<i>Ming-Wei Chang, Chih-Jen Lin and Ruby C. Weng</i>	

WedAmRm2: Self-Organizing Feature Maps and Vector Quantization I Chair(s): Alex Tay (Nanyang Technological University, Singapore); Emin Gemen (Anadolu University, Turkey)

K-Means Fast Learning Artificial Neural Network, An Alternative Network for Classification (#1080)	925
<i>Alex Tay and Sandeep Prakash</i>	
Increasing the Topological Quality of Kohonen's Self-Organising Map by Using a Hit Term (#1472)	930
<i>Emin Gemen</i>	
Self-Organizing Neural Networks Using Adaptive Neurons (#1396)	935
<i>Jong-Seok Lee and Cheol Hoon Park</i>	
Fingerprint Identification with LVQ (#1413)	940
<i>Gulzar Khuwaja</i>	
A New Unsupervised Competitive Learning Algorithm for Vector Quantization (#1125)	944
<i>Tzu-Chao Lin and Pao-Ta Yu</i>	
Structure Adaptive SOM to Classify 3-Dimensional Point Light Actors' Gender (#1866)	949
<i>Sung-Bae Cho</i>	

WedAmRm3: Implementation of Neural Networks on Reconfigurable Hardware

Chair(s): Amos Omondi (Flinders University, Australia)

Neural Networks in FPGAs (Invited) (#2248)	954
<i>Amos Omondi and Jagath Rajapakse</i>	
FPGA Realization of Backpropagation for Stock Market Prediction (#1740)	960
<i>Mamun Bin Ibne Reaz, Syed Zahidul Islam, Mohd. Alauddin Mohd. Ali and Mohd Shahiman Sulaiman</i>	
Single Chip VLSI Realization of Neural Net for Fast Decision Making Functions (#1799)	965
<i>Frank Stuepmann, Steffen Rode and Gundolf Geske</i>	
Hardware Implementation of Neural Network with Expansible and Reconfigurable Architecture (#1960)	970
<i>Seok Bae Yun, Young Joo Kim, Sung Soo Dong and Chong Ho Lee</i>	
Brainway Computer Implementation Availability Using Reconfiguration (#2023)	976
<i>Alessandro Noriaki Ide, José Hiroki Saito and Sandra Abib</i>	
VLSI Implementation of a Neural Network Classifier Based on the Saturating Linear Activation Function (#1314)	981
<i>Amine Bermak and Abdesselam Bouzerdoun</i>	

WedAmRm4: Statistical Neural Network Models I

Chair(s): Lei Xu (Chinese University of Hong Kong, Hong Kong)

Feature Selection for RBF Networks (#1666)	986
<i>Juergen Paetz</i>	
Number of Statistical Independent Factors in Arbitrage Pricing Theory from the Perspective of Non-Gaussian Factor Analysis (#1198)	991
<i>Kai-Chun Chiu and Lei Xu</i>	
Face and Non-Face Classification by Multinomial Logit Model and Kernel Feature Compound Vectors (#1501)	996
<i>Osamu Hasegawa and Takio Kurita</i>	
Feature Extraction in Support Vector Machine: A Comparison of PCA, KPCA and ICA (#1655)	1001
<i>Lijuan Cao and Wai Keong Chong</i>	
Nonlinear Regression and Multiclass Classification Via Regularized Radial Basis Function Networks (#1097)	1006
<i>Tomohiro Ando and Sadanori Konishi</i>	

WedAmRm5: Radial Basis Function Networks

Chair(s): Lipo Wang (Nanyang Technological University, Singapore)

Generalizing a Generic Elliptic RBF Learning by Bootstrap (#1471)	1011
<i>Anocha Rugchatjaroen, Kodchakorn Na Nakornphanom, Chidchanok Lursinsap and Suchada Siripant</i>	
Training RBF Neural Networks with Unbalanced Data (#1135)	1016
<i>Xiuju Fu, Lipo Wang, Kok Seng Chua and Feng Chu</i>	
A Novel Learning Algorithm for Data Classification with Radial Basis Function Networks (#1388)	1021
<i>Yen-Jen Oyang, Shien-Ching Hwang, Yu-Yen Ou, Chien-Yu Chen and Zhi-Wei Chen</i>	
Fault Immunization Model for Elliptic Radial Basis Function Neuron (#1414)	1027
<i>Kodchakorn Na Nakornphanom, Chidchanok Lursinsap and Anochar Rugchatjaroen</i>	
A New Recurrent Radial Basis Function Network (#1538)	1032

Yiu-Ming Cheung

An Efficient Learning Algorithm for Function Approximation with Radial Basis Function Networks (#1952)	1037
<i>Yen-Jen Oyang and Shien-Ching Hwang</i>	

WedAmRm6: Support Vector Machines and Kernel Methods I

Chair(s): Marimuthu Palaniswami (University of Melbourne, Australia)

Adaptive Support Vector Machines for Regression (Invited) (#2270)	1043
<i>Marimuthu Palaniswami and Alistair Shilton</i>	
On the Separability of Kernel Functions (#1166)	1050
<i>Tao Wu, Hangen He and Dewen Hu</i>	
Support Vector Machines Using Multi Objective Programming and Goal Programming (#1335)	1053
<i>Hirotsuka Nakayama and Takeshi Asada</i>	
A Fast Method of Constructing Kernel Patterns for Morphological Associative Memory (#1847)	1058
<i>Motonobu Hattori, Atsushi Fukui and Hiroshi Ito</i>	
Kernel Covering Algorithm and a Design Principle for Feed-forward Neural Networks (#1848)	1064
<i>Gaowei Wu, Qing Tao and Jue Wang</i>	
SVM Maximizing Margin in the Input Space (#1108)	1069
<i>Shotaro Akaho</i>	
Author Index	A-1