

Lecture Notes in Artificial Intelligence 6422

Edited by R. Goebel, J. Siekmann, and W. Wahlster

Subseries of Lecture Notes in Computer Science

Jeng-Shyang Pan Shyi-Ming Chen
Ngoc Thanh Nguyen (Eds.)

Computational Collective Intelligence

Technologies and Applications

Second International Conference, ICCCI 2010
Kaohsiung, Taiwan, November 10-12, 2010
Proceedings, Part II

Series Editors

Randy Goebel, University of Alberta, Edmonton, Canada
Jörg Siekmann, University of Saarland, Saarbrücken, Germany
Wolfgang Wahlster, DFKI and University of Saarland, Saarbrücken, Germany

Volume Editors

Jeng-Shyang Pan
National Kaohsiung University of Applied Sciences
Department of Electronic Engineering
415 Chien-Kung Road, Kaohsiung 807, Taiwan
E-mail: jspan@cc.kuas.edu.tw

Shyi-Ming Chen
National Taiwan University of Science and Technology
Department of Computer Science and Information Engineering #43, Sec.4
Keelung Rd., Taipei, 106, Taiwan
E-mail: smchen@mail.ntust.edu.tw

Ngoc Thanh Nguyen
Wroclaw University of Technology, Institute of Informatics
Str. Wyb. Wyspianskiego 27, 50-370 Wroclaw, Poland
E-mail: ngoc-thanh.nguyen@pwr.wroc.pl

Library of Congress Control Number: 2010937276

CR Subject Classification (1998): I.2, I.2.11, H.3-4, C.2, D, H.5

LNCS Sublibrary: SL 7 – Artificial Intelligence

ISSN 0302-9743
ISBN-10 3-642-16731-4 Springer Berlin Heidelberg New York
ISBN-13 978-3-642-16731-7 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.com

© Springer-Verlag Berlin Heidelberg 2010
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper 06/3180

Preface

This volume composes the proceedings of the Second International Conference on Computational Collective Intelligence—Technologies and Applications (ICCCI 2010), which was hosted by National Kaohsiung University of Applied Sciences and Wroclaw University of Technology, and was held in Kaohsiung City on November 10-12, 2010. ICCCI 2010 was technically co-sponsored by Shenzhen Graduate School of Harbin Institute of Technology, the Tainan Chapter of the IEEE Signal Processing Society, the Taiwan Association for Web Intelligence Consortium and the Taiwanese Association for Consumer Electronics. It aimed to bring together researchers, engineers and policymakers to discuss the related techniques, to exchange research ideas, and to make friends. ICCCI 2010 focused on the following themes:

- Agent Theory and Application
- Cognitive Modeling of Agent Systems
- Computational Collective Intelligence
- Computer Vision
- Computational Intelligence
- Hybrid Systems
- Intelligent Image Processing
- Information Hiding
- Machine Learning
- Social Networks
- Web Intelligence and Interaction

Around 500 papers were submitted to ICCCI 2010 and each paper was reviewed by at least two referees. The referees were from universities and industrial organizations. 155 papers were accepted for the final technical program. Four plenary talks were kindly offered by: Gary G. Yen (Oklahoma State University, USA), on “Population Control in Evolutionary Multi-objective Optimization Algorithm,” Chin-Chen Chang (Feng Chia University, Taiwan), on “Applying De-clustering Concept to Information Hiding,” Qinyu Zhang (Harbin Institute of Technology, China), on “Cognitive Radio Networks and Its Applications,” and Lakhmi C. Jain (University of South Australia, Australia), on “Intelligent System Design in Security.”

We would like to thank the authors for their tremendous contributions. We would also express our sincere appreciation to the reviewers, Program Committee members and the Local Committee members for making this conference successful. Finally,

we would like to express special thanks for the financial support from the National Kaohsiung University of Applied Sciences, Kaohsiung City Government, National Science Council and Education Ministry, Taiwan, in making ICCCI 2010 possible.

November 2010

Ngoc Thanh Nguyen
Jeng-Shyang Pan
Shyi-Ming Chen
Ryszard Kowalczyk

ICCCI 2010 Conference Organization

Honorary Chair

Chun-Hsiung Fang	National Kaohsiung University of Applied Sciences, Taiwan
Jui-Chang Kung	Cheng Shiu University, Taiwan

General Chair

Ngoc Thanh Nguyen	Wroclaw University of Technology, Poland
-------------------	--

Program Committee Chair

Jeng-Shyang Pan	National Kaohsiung University of Applied Sciences, Taiwan
Shyi-Ming Chen	National Taiwan University of Science and Technology, Taiwan
Ryszard Kowalczyk	Swinburne University of Technology, Australia

Special Session Chairs

Bao-Rong Chang	National University of Kaohsiung, Taiwan
Chang-Shing Lee	National University of Tainan, Taiwan
Radoslaw Katarzyniak	Wroclaw University of Technology, Poland

International Advisory Chair

Bin-Yih Liao	National Kaohsiung University of Applied Sciences, Taiwan
--------------	--

International Publication Chair

Chin-Shin Shieh	National Kaohsiung University of Applied Sciences, Taiwan
Bing-Hong Liu	National Kaohsiung University of Applied Sciences, Taiwan

Local Organizing Committee Chair

Mong-Fong Horng National Kaohsiung University of Applied Sciences,
Taiwan

ICCCI 2010 Steering Committee

Chair

Ngoc Thanh Nguyen Wroclaw University of Technology, Poland

Co-chair

Ryszard Kowalczyk	Swinburne University of Technology, Australia
Shyi-Ming Chen	National Taiwan University of Science and Technology, Taiwan
Adam Grzech	Wroclaw University of Technology, Poland
Lakhmi C. Jain	University of South Australia, Australia
Geun-Sik Jo	Inha University, South Korea
Janusz Kacprzyk	Polish Academy of Sciences, Poland
Ryszard Tadeusiewicz	AGH-UST, Poland
Toyoaki Nishida	Kyoto University, Japan

ICCCI 2010 Technical Program Committee

Jeng Albert B.	Jinwen University of Science and Technology, Taiwan
Gomez-Skarmeta Antonio F.	Murcia University, Spain
Shih An-Zen	Jinwen University of Science and Technology, Taiwan
Andres Cesar	Universidad Complutense de Madrid, Spain
Hsieh Cheng-Hsiung	Chaoyang University of Technology, Taiwan
Lee Chin-Feng	Chaoyang University of Technology, Taiwan
Badica Costin	University of Craiova, Romania
Godoy Daniela	Unicen University, Argentina
Barbucha Dariusz	Gdynia Maritime University, Poland
Greenwood Dominic	Whitestein Technologies, Switzerland
CAPKOVIC Frantisek	Slovak Academy of Sciences, Slovakia
Yang Fuw-Yi	Chaoyang University of Technology, Taiwan
Huang Hsiang-Cheh	National University of Kaohsiung, Taiwan
Chang Hsuan-Ting	National Yunlin University of Science and Technology, Taiwan
Lee Huey-Ming	Chinese Culture University, Taiwan
Deng Hui-Fang	South China University of Technology, China
Czarnowski Ireneusz	Gdynia Maritime University, Poland
Lu James J.	Emory University, USA
Kacprzyk Janusz	Polish Academy of Sciences, Poland

Marecki Janusz	IBM T.J. Watson Research, USA
Sobecki Janusz	Wroclaw University of Technology, Poland
Jung Jason J.	Yeungnam University, South Korea
Nebel Jean-Christophe	Kingston University, USA
Dang Jiangbo	Siemens Corporate Research, USA
Huang Jingshan	University of South Alabama, USA
Chang Jui-fang	National Kaohsiung University of Applied Sciences, Taiwan
Nunez Manuel	Universidad Complutense de Madrid, Spain
Gaspari Mauro	University of Bologna, Italy
Khurram Khan Muhammad	King Saud University, Saudi Arabia
Sheng Quan Z.	University of Adelaide, Australia
Katarzyniak Radoslaw	Wroclaw University of Technology, Poland
Unland Rainer	University of Duisburg-Essen, Germany
Ching Chen Rung	Chaoyang University of Technology, Taiwan
Shen Rung-Lin	National Taipei University, Taiwan
Yang Sheng-Yuan	St. John's University, Taiwan
Yen Shu-Chin	Wenzao Ursuline College of Languages, Taiwan
Chen Shyi-Ming	National Taiwan University of Science and Technology, Taiwan
Zadrozny Slawomir	Polish Academy of Sciences, Poland
Hammoudi Slimane	ESEO, France
Hong Tzung-Pei	National University of Kaohsiung, Taiwan
Hsu Wen-Lian	Academia Sinica, Taiwan
Pedrycz Witold	University of Alberta, Canada
Baghdadi Youcef	Sultan Qaboos University, Oman
Lo Yu-lung	Chaoyang University of Technology, Taiwan
Cheng Yuh Ming	Shu-Te University, Taiwan
Huang Yung-Fa	Chaoyang University of Technology, Taiwan
Ye Yunming	Harbin Institute of Technology, China

Keynote Speakers

Gary G. Yen	Oklahoma State University, USA
Lakhmi C. Jain	University of South Australia, Australia
Chin-Chen Chang	Feng Chia University, Taiwan
Qinyu Zhang	Harbin Institute of Technology Shenzhen Graduate School, China

Program Committee of Special Sessions

Dariusz Barbucha	Gdynia Maritime University, Poland
Bao-Rong Chang	National University of Kaohsiung, Taiwan
Hsuan-Ting Chang	National Yunlin University of Science and Technology, Taiwan

Chuan-Yu Chang	National Yunlin University of Science and Technology, Taiwan
Rung-Ching Chen	Chaoyang University of Technology, Taiwan
Shyi-Ming Chen	National Taiwan University of Science and Technology, Taiwan
Kazimierz Choroś	Wrocław University of Technology, Poland
Mohamed Hassoun	ENSSIB Villeurbanne, France
Mong-Fong Horng	National Kaohsiung University of Applied Sciences, Taiwan
Chien-Chang Hsu	Fu-Jen Catholic University, Taiwan
Wu-Chih Hu	National Penghu University of Science and Technology, Taiwan
Chien-Feng Huang	National University of Kaohsiung, Taiwan
Tien-Tsai Huang	Lunghwa University of Science and Technology, Taiwan
Huey-Ming Lee	Chinese Culture University, Taiwan
Che-Hung Lin	Cheng Shiu University, Taiwan
Lily Lin	China University of Technology, Taiwan
Piotr Jędrzejowicz	Gdynia Maritime University, Poland
Jeng-Shyang Pan	National Kaohsiung University of Applied Sciences, Taiwan
Chia-Nan Wang	National Kaohsiung University of Applied Sciences, Taiwan

Table of Contents – Part II

Social Networks

Influence Clubs in Social Networks	1
<i>Chin-Ping Yang, Chen-Yi Liu, and Bang Ye Wu</i>	
A Method of Label-Dependent Feature Extraction in Social Networks	11
<i>Tomasz Kajdanowicz, Przemysław Kazienko, and Piotr Dasko</i>	
Identifying Representative Reviewers in Internet Social Media	22
<i>Sang-Min Choi, Jeong-Won Cha, and Yo-Sub Han</i>	
Fitcolab Experimental Online Social Networking System	31
<i>Haris Memic</i>	
General Network Properties of Friendship Online Social Network	41
<i>Haris Memic</i>	

Innovations in Computation and Application

Fuzzy Decision Making for IJV Performance Based on Statistical Confidence-Interval Estimates	51
<i>Huey-Ming Lee, Teng-San Shih, Jin-Shieh Su, and Lily Lin</i>	
Designing a Learning System Based on Voice Mail – A Case Study of English Oral Training	61
<i>Huey-Ming Lee and Chien-Hsien Huang</i>	
A Gene Selection Method for Microarray Data Based on Sampling	68
<i>Yungho Leu, Chien-Pang Lee, and Hui-Yi Tsai</i>	
The Similarity of Video Based on the Association Graph Construction of Video Objects	75
<i>Ping Yu</i>	
Using SOA Concept to Construct an e-Learning System for College Information Management Courses	85
<i>Chung C. Chang and Kou-Chan Hsiao</i>	
Cryptanalysis on Sun-Yeh's Password-Based Authentication and Key Distribution Protocols with Perfect Forward Secrecy	95
<i>Wen-Gong Shieh and Wen-Bing Horng</i>	

Using Genetic Algorithms for Personalized Recommendation	104
<i>Chein-Shung Hwang, Yi-Ching Su, and Kuo-Cheng Tseng</i>	

Intellignet Signal Processing for Human-Machine Interaction (I)

Pretreatment for Speech Machine Translation	113
<i>Xiaofei Zhang, Chong Feng, and Heyan Huang</i>	
Emotion Aware Mobile Application	122
<i>Radoslaw Nielek and Adam Wierzbicki</i>	
Boosting-Based Ensemble Learning with Penalty Setting Profiles for Automatic Thai Unknown Word Recognition	132
<i>Jakkrit TeCho, Chohwich Nattee, and Thanaruk Theeramunkong</i>	
AONT Encryption Based Application Data Management in Mobile RFID Environment	142
<i>Namje Park and Youjin Song</i>	
A Query Answering Greedy Algorithm for Selecting Materialized Views	153
<i>T.V. Vijay Kumar and Mohammad Haider</i>	
Capturing Users' Buying Activity at Akihabara Electric Town from Twitter	163
<i>The-Minh Nguyen, Takahiro Kawamura, Yasuyuki Tahara, and Akihiko Ohsuga</i>	

Novel Approaches to Intelligent Applications

Private Small-Cloud Computing in Connection with WinCE Thin Client	172
<i>Bao Rong Chang, Hsiu Fen Tsai, Chien-Feng Huang, and His-Chung Huang</i>	
Honey Bee Mating Optimization Algorithm for Approximation of Digital Curves with Line Segments and Circular Arcs	183
<i>Shu-Chien Huang</i>	
Harmful Adult Multimedia Contents Filtering Method in Mobile RFID Service Environment	193
<i>Namje Park and Youngsoo Kim</i>	
Efficient GHA-Based Hardware Architecture for Texture Classification	203
<i>Shiow-Jyu Lin, Yi-Tsan Hung, and Wen-Jyi Hwang</i>	

Stability by Feedback of the Second Order Singular Distributed Parameter Systems Containing Infinite Many Poles	213
<i>Feng Liu, Guodong Shi, and Jianchun Wu</i>	

Mining Generalized Association Rules with Quantitative Data under Multiple Support Constraints	224
<i>Yeong-Chyi Lee, Tzung-Pei Hong, and Chun-Hao Chen</i>	

Intelligent Technologies for Medical Related Applications

Comparison of Edge Segmentation Methods to Tongue Diagnosis in Traditional Chinese Medicine	232
<i>Chieh-Hsuan Wang, Ching-Chuan Wei, and Che-Hao Li</i>	

The Grading of Prostatic Cancer in Biopsy Image Based on Two Stages Approach	239
<i>Shao-Kuo Tai, Cheng-Yi Li, Yee-Jee Jan, and Shu-Chuan Lin</i>	

Automatic Drug Image Identification System Based on Multiple Image Features	249
<i>Rung-Ching Chen, Cho-Tsan Pao, Ying-Hao Chen, and Jeng-Chih Jian</i>	

On the Development of a Brain Simulator	258
<i>Wen-Hsien Tseng, Song-Yun Lu, and Hsing Mei</i>	

Obstructive Sleep Apnea Diagnosis from Electroencephalography Frequency Variation by Radial Basis Function Neural Network	268
<i>Chien-Chang Hsu and Jie Yu</i>	

Authentication and Protection for Medical Image	278
<i>Chih-Hung Lin, Ching-Yu Yang, and Chia-Wei Chang</i>	

Intellignet Signal Processing for Human-Machine Interaction (II)

FLC-Regulated Speaker Adaptation Mechanisms for Speech Recognition	288
<i>Ing-Jr Ding</i>	

Monitoring of the Multichannel Audio Signal	298
<i>Eugeniusz Kornatowski</i>	

Watermark Synchronization Based on Locally Most Stable Feature Points	307
<i>Jiansheng Qian, Leida Li, and Zhaolin Lu</i>	

Audio Watermarking with HOS-Based Cepstrum Feature	316
<i>Bo-Lin Kuo, Chih-Cheng Lo, Chi-Hua Liu, Bin-Yih Liao, and Jeng-Shyang Pan</i>	

Processing Certificate of Authorization with Watermark Based on Grid Environment	324
<i>Heng-Sheng Chen, Tsang-Yean Lee, and Huey-Ming Lee</i>	

Novel Approaches to Collective Computations and Systems

Probability Collectives Multi-Agent Systems: A Study of Robustness in Search	334
<i>Chien-Feng Huang and Bao Rong Chang</i>	

An Improved Ant Algorithm for Fuzzy Data Mining	344
<i>Min-Thai Wu, Tzung-Pei Hong, and Chung-Nan Lee</i>	

Information-Driven Collective Intelligences	352
<i>Francesca Arcelli Fontana, Ferrante Formato, and Remo Pareschi</i>	

Instructional Design for Remedial English e-Learning	363
<i>Chia-ling Hsu, Ai-ling Wang, and Yuh-chang Lin</i>	

A Web-Based E-Teaching System under Low Bit-Rate Constraint	373
<i>Wei-Chih Hsu, Cheng-Hsiu Li, and Tzu-Hung Chuang</i>	

Using Freeware to Construct a Game-Based Learning System	381
<i>Yuh-Ming Cheng and Li-Hsiang Lu</i>	

Intelligent Systems

Three Kinds of Negations in Fuzzy Knowledge and Their Applications to Decision Making in Financial Investment	391
<i>Zhenghua Pan, Cen Wang, and Lijuan Zhang</i>	

Using Fuzzy Neural Network to Explore the Effect of Internet on Quality of Life	402
<i>Jui-Chen Huang</i>	

The Power Load Forecasting by Kernel PCA	411
<i>Fang-Tsung Liu, Chiung-Hsing Chen, Shang-Jen Chuang, and Ting-Chia Ou</i>	

A Study of USB 3 in Perspective Aspect	425
<i>Yeh Wei-Ming</i>	

A Study of CAPTCHA and Its Application to User Authentication	433
<i>Albert B. Jeng, Chien-Chen Tseng, Der-Feng Tseng, and Jiunn-Chin Wang</i>	

TAIEX Forecasting Based on Fuzzy Time Series and the Automatically Generated Weights of Defuzzified Forecasted Fuzzy Variations of Multiple-Factors	441
<i>Shyi-Ming Chen and Huai-Ping Chu</i>	

Advanced Knowledge Management (I)

Concept Document Repository to Support Research of the Coal Industry Development Forecasting	451
<i>Liudmila Takayshvili</i>	

Forecasting Coal and Rock Dynamic Disaster Based on Adaptive Neuro-Fuzzy Inference System	461
<i>Jianying Zhang, Jian Cheng, and Leida Li</i>	

Context-Aware Workflow Management Based on Formal Knowledge Representation Models	470
<i>Fu-Shiung Hsieh</i>	

A Consensus-Based Method for Fuzzy Ontology Integration	480
<i>Ngoc Thanh Nguyen and Hai Bang Truong</i>	

Contextual Information Search Based on Ontological User Profile	490
<i>Nazim uddin Mohammed, Trong Hai Duong, and Geun Sik Jo</i>	

Rough Sets Based Association Rules Application for Knowledge-Based System Design	501
<i>Shu-Hsien Liao and Yin-Ju Chen</i>	

Author Index	511
-------------------------------	------------