

2008 IEEE Conference on Soft Computing in Industrial Applications

(SMCia/08)

**Muroran, Japan
25 – 27 June 2008**



IEEE Catalog Number: CFP08785-PRT
ISBN: 978-1-4244-3782-5

Table of Contents

Agent

Learning of Communication Codes in Multi-Agent Reinforcement Learning Problem 1
Tatsuya Kasai, Hiroshi Tenmoto, Akimoto Kamiya

A Study on Automatic Parking for Automobiles Using Rational Policy Making Method 7
Hiroto Nakamura, Yoshitaka Yafuso, Kota Watanabe, Hajime Igarashi

Intelligent-Agent Based Approach for Assembly Automation 13
Munir Merdan, Gottfried Koppensteiner, Alois Zoitl, Ingo Hegny

Learning of Fugitive Robot Using Optical Information τ 20
Hiroyuki Fujii, Jun Sakuma, Isao Ono, Shigenobu Kobayashi

PSO

Particle Swarm Optimization Incorporating Simplex Search and Center Particle for Global Optimization 26
Chen-Chien Hsu, Chun-Hwui Gao

Digital Redesign of Uncertain Interval Systems Based on Time-Response Resemblance via Particle Swarm Optimization 32
Chen-Chien Hsu, Geng-Yu Lin

Using Particle Swarm Optimization to Solve Resource-Constrained Scheduling Problems 38
Shih-Tang Lo, Ruey-Maw Chen, Der-Fang Shiau, Chung-Lun Wu

Algorithms and Techniques

A New Approach for Boolean Matrix Multiplication with DNA Computing 44
Nordiana Rajae, H. Aoyagi, K. Yabe, Y. Kon, Osamu Ono

Multilingual Text Categorization Using Character N-gram 49
Makoto Suzuki, Naohide Yamagishi, Yi-Ching Tsai, Shigeichi Hirasawa

User Modeling by Confabulation Theory 55
Mario Köppen, Kaori Yoshida

Cooperative Partner System of Imperfect Information Game	60
K. Ohsone, T. Onisawa	

Fuzzy Theory and Systems 1

Perceptual Image Segmentation Using Fuzzy-Based Hierarchical Algorithm and Its Application to Dermoscopy Images	66
--	-----------

J. Maeda, A. Kawano, S. Yamauchi, Y. Suzuki, A. R. S. Marçal, T. Mendonça

Fuzzy Set Theoretical Approach to the RGB Tone Triangular System	72
---	-----------

Naotoshi Sugano

Fuzzy Logic Based Content Protection for Image Resizing by Seam Carving	78
--	-----------

Sushil Subramanian, Kundan Kumar, Bibhu Prasad Mishra, Animesh Banerjee, Debdutta Bhattacharya

Color Image Compression with Vector Quantization	84
---	-----------

Hiroki Matsumoto, Kazuya Sasazaki, Yukinori Suzuki

EC 1

Optimization in Electromagnetics Using the Real-Coded Clonal Selection Algorithm	89
---	-----------

Felipe Campelo, Frederico G. Guimarães, Jaime A. Ramírez, Hajime Igarashi

Modifying Ant Colony Optimization	95
--	-----------

Sarayut Nonsiri, Siriporn Supratid

An Effective Ant Colony Optimization-Based Algorithm for Flow Shop Scheduling	101
--	------------

Ruey-Maw Chen, Shih-Tang Lo, Chung-Lun Wu, Tsung-Hung Lin

Chaotic Maps in Binary Particle Swarm Optimization for Feature Selection	107
---	------------

Cheng-San Yang, Li-Yeh Chuang, Jung-Chike Li, Cheng-Hong Yang

Networks

Analysis of Command Frequency and Command Sequence Grammar in IDS	113
--	------------

Jian Zhou, Haruhiko Shirai, Jousuke Kuroiwa, Tomohiro Odaka, Hisakazu Ogura

Heavy Loading Effects in Networked Systems	119
---	------------

Miika Rajala

A Framework for Large-Scale Simulation of Collaborative Intrusion Detection Systems 125
Dominik Fisch, Alexander Hofmann, Valentin Hornik, Ivan Dedinski, Bernhard Sick

Trusted Spanning Trees for Delay Tolerant Mobile Ad Hoc Networks 131
Apivadee Piyatumrong, Pascal Bouvry, Frédéric Guinand, Kittichai Lavangnananda

Fuzzy Theory and Systems 2

On the Infimum and Supremum of Simplified Fuzzy Inference Method 137
Hirosato Seki, Hiroaki Ishii

Knowledge Fusion Using Dempster-Shafer Theory and the Imprecise Dirichlet Model 142
Daniel Andrade, Timo Horeis, Bernhard Sick

A Lattice Visualization Method by Formal Concept Analysis and Its Application to Huge Image Database 149
Kazuhito Sawase, Hajime Nobuhara

On-Line Training of Freehand Curve Identifier FSCI in Sketch-Based CAD System 153
Takahiro Doushita, Sato Saga

EC 2

A Hybrid Approach for Selecting Gene Subsets Using Gene Expression Data 159
Cheng-San Yang, Li-Yeh Chuang, Chao-Hsuan Ke, Cheng-Hong Yang

Layout Algorithm for an EC-Based Room Layout Planning Support System 165
Makoto Inoue, Hideyuki Takagi

Optimization of HMM with Interactive Evolutionary Computation for Composing System 171
Hiroshi Hasui, Hisakazu Ogura

Empirical Analysis on the Application of Simulated Annealing for RFID Reader Networks 177
Sheng-wei Hung, John Sum, Yung-fa Huang

Systems and Applications 1

FPGA Implementation of a Blind Source Separation System Based on Stochastic Computing 182
Michihiro Hori, Michihito Ueda

Empirical Analysis of Grouping Web Pages Using Vector Space Model for Link Structures 188
Yuichi Sasaki, Masahito Kurihara

Range Estimation Using TDL Neural Networks and Application to Image-Based Visual Servoing 194
Farid arvani, George K. I. Mann, Andrew Fisher, Raymond G. Gosine

Hybrid Feature Selection Method Using Gene Expression Data 199
Li-Yeh Chuang, Kuo-Chuan Wu, Cheng-Hong Yang

EMO

Multi-Objective Controller Evolution of RF Localization for Mobile Autonomous Robots 205
Chin Kim On, Jason Teo, Azali Saudi

A Methodology Using EMO for Parameter Estimation of SVM Kernel Function 211
Shinya Watanabe, Yukiyo Kimura

Load Frequency Control in Interconnected Power System Using Multi-Objective PID Controller 217
A. Sharifi, K. Sabahi, M. Aliyari Shoorehdeli, M.A. Nekoui, M. Teshnehlab

Psychology

Estimation of the Workload with Visual Display Terminal by Salivary Immune Substance 222
Shusaku Nomura

Rough Set Analysis on the Relation Between Human Psychological Mood State and the Immune Function 228
Yasuo Kudo, Shusaku Nomura

Perceptual Cost for Motion Transparency Depends on the Measures of Psychophysical Performance 234
Osamu Watanabe, Naoto Suzuki

Financial Applications

Use of Neural Networks in Forecasting Financial Market 240
Hosein Marzi, Mark Turnbull, Elham Marzi

Tracking Federal Funds Target Rate Movements Using Artificial Neural Networks 246
Jon T.S. Quah, V Hemamalini

**Forecasting Financial Time Series with Support Vector Machines Based on Dynamic
Kernels** 252
Johannes Mager, Ulrich Paasche, Bernhard Sick

Multi-Media Processing and Systems(Special Session)

Computer Vision Based Fire Detection in Color Images 258
Turgay Celik, Kai-Kuang Ma

**Nonlinear Denoising Filter for Images with Interactive Evolutionary Computing
Considering the Subjective Assessment** 264
Kaoru Arakawa, Kohei Nomoto

**Enhancement of MPEG/JPEG Images Based on Histogram Equalization without
Gamut Problem** 269
Akira Taguchi

RTL Design of Parallel FFT with Block Floating Point Arithmetic 273
Hiroshi Ochi

**Evaluation and Implementation of Quasi-Cyclic LDPC Codes for IEEE802.11n Based
MIMO-OFDM System** 277
Xiaonan Shi, Shingo Yoshizawa, Yoshikazu Miyanaga

Kukanchi: Interactive Human-Space Design and Intelligence(Special Session)

**Verifying Reliability Interactions for the Robot Communication Platform and
Contribution to the International Standards** 281
Masahiko Narita, Kazunori Iwasa, Makiko Shimamura, Toru Yamaguchi

Intelligent Network Mobility in Human Centered City 287
Atsuhiko Nakamura, Toru Yamaguchi, Eri Sato-Shimokawara

Integration of Multiple Speech Recognition Modules Based on RT-Middleware 293
Hiroki Nanba, Yayoi Ito, Yasufumi Takama

**Cooperation with the Mobile Robot and Home Electric Appliances by Using RT
Middle Ware** 297
Toshiyuki Kusunoki, Kazuyoshi Wada, Hayato Takayama, Takashi Suzuki

Structured Learning for Partner Robots Based on Natural Communication 303
Naoyuki Kubota, Akihiro Yorita

Chaos

- On the Robust Chaos Synchronization of RCLSJ Models** 309
Cheng-Fang Huang, Jui-Sheng Lin, Jun-Juh Yan, Cheng-Chi Wang
- Adaptive Synchronization of Chaotic Systems via T-S Fuzzy Model** 313
Zhang-Lin Wan, Yi-You Hou, Jun-Juh Yan, Teh-Lu Liao
- Chaos Suppression of Generalized Lorenz System: Adaptive Fuzzy Sliding Mode Control Approach** 318
Chang-Kuo Chen, Jun-Juh Yan, Teh-Lu Liao, Meei-Ling Hung
- Chaos Synchronization of a Horizontal Platform System via Output Feedback Control** 322
Yi-Sung Yang, Jun-Juh Yan, Teh-Lu Liao, Jui-Sheng Lin

GA 1

- Sharing Evolution Genetic Algorithm for Global Numerical Optimization** 326
Sheng-Ta Hsieh, Tsung-Ying Sun, Chan-Cheng Liu
- Primer Design with Specific PCR Product Size Using Memetic Algorithm** 332
Cheng-Hong Yang, Yu-Huei Cheng, Hsueh-Wei Chang, Li-Yeh Chuang
- Optimization of Instance-Based Policy Based on Real-Coded Genetic Algorithms** 338
Atsushi Miyamae, Jun Sakuma, Isao Ono, Shigenobu Kobayashi
- Reducing the Search Space in Genetic Algorithm: An Application in Emergence of Cities** 344
K. Lavangnananda, C. Wongwattanakarn

Systems and Applications 2

- Maximum Power Extraction with Numerical Grey Relational Analysis Sensorless Controller for Wind-Turbine Generator** 350
Shi-Jaw Chen, Jian Liung Chen, Chia-Hung Lin, Wei-Der Chang, Her-Terng Yau, Nai Ren Guo
- Carpal Growth Assessment Based on Fuzzy Description** 355
Chi-Wen Hsieh, Tai-Lang Jong, Chui-Mei Tiu
- Image Compression Using Wavelet Transform and Vector Quantization with Variable Block Size** 359
Osamu Yamanaka, Tsuyoshi Yamaguchi, Junji Maeda, Yukinori Suzuki

Identity Detection from On-Line Handwriting Time Series	365
Yusuke Manabe, Basabi Chakraborty	

Fuzzy Theory and Systems 3

Fuzzy C-Means for Data with Tolerance by Introducing Penalty Term	371
Yuchi Kanzawa, Yasunori Endo, Sadaaki Miyamoto	

An Adaptive Fuzzy Classification System	377
Nai Ren Guo, Chao-Lin Kuo, Tzong-Jiy Tsai, Shi-Jaw Chen	

Keeping the Stability of Solutions in Dynamic Fuzzy CSPs	382
Yasuhiro Sudo, Masahito Kurihara, Takuto Yanagida	

Flexible Widget Layout with Fuzzy Constraint Satisfaction	387
Takuto Yanagida, Hidetoshi Nonaka	

GA 2

Improving Search Performance of Linear Genetic Programming Based Image Recognition Program Synthesis by Redundancy-Removed Recombination	393
Ukrit Watchareeruetai, Yoshinori Takeuchi, Tetsuya Matsumoto, Hiroaki Kudo, Noboru Ohnishi	

A Study on Performance of MOGA and HLCGA for the Linear Ordering Problem	399
Pavel Krömer, Jan Platoš, Václav Snášel	

Optimal Determination of Wavelet Threshold and Decomposition Level via Heuristic Learning for Noise Reduction	405
Tsung-Ying Sun, Chan-Cheng Liu, Sheng-Ta Hsieh, Tsung-Ying Tsai, Jyun-Hong Jheng	

Code Book Optimization with a Genetic Algorithm for Vector Quantization	411
Yoshitaka Takeda, Sinya Watanabe, Yukinori Suzuki	

SOM

Fatigue Level Estimation of Bill Based on Acoustic Energy Features by Supervised SOM	415
Masaru Teranishi, Sigeru Omatu, Toshihisa Kosaka	

Self Organizing Map Neural Network with Fuzzy Screening for Micro-Calcifications Detection on Mammograms	421
Chui-Mei Tiu, Tai-Lang Jong, Chi-Wen Hsieh	

Author Index