2016 Joint 8th International Conference on Soft Computing and Intelligent Systems (SCIS 2016) and 17th International Symposium on Advanced Intelligent Systems (ISIS 2016)

Sapporo, Japan
25-28 August 2016

Pages 1-557

IEEE Catalog Number: CFP1664T-POD
ISBN: 978-1-5090-2679-1

Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP1664T-POD
ISBN (Print-On-Demand): 978-1-5090-2679-1
ISBN (Online): 978-1-5090-2678-4

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2016 Joint 8th International Conference on Soft Computing and Intelligent Systems and 2016 17th International Symposium on Advanced Intelligent Systems

SCIS-ISIS 2016

Table of Contents

Message from the General Chairs xxii
Message from the Program Committee Chairs xxiv
Plenary Talks xxvi
Invited Talks xxx
Organizing Committee xxxv
Program Committee Members xxxvii
Best Paper Award xl
Reviewers List xli

[Fr2-1] GS: Intelligent Systems and Robot

Fuzzy Evaluation of Macroscopic Situation for Turn Based Strategic Games 1
Kosuke Muto and Junji Nishino

Gait Recognition from Freestyle Walks Using Relative Coordinates and Random Subsequence-Based Sum-Rule Classification 5
Nitchan Jianwattanapaisarn, Nirattaya Khamsemanan, and Cholwich Nattee

Learning Adaptive Escape Behavior for Wheel-Legged Robot by Inner Torque Information 10
Yuki Nishimura and Sadayoshi Mikami

Dynamic Global PID Sliding Mode Control for MEMS Gyroscope Using Adaptive Neural Controller 16
Juntao Fei and Yundi Chu

[Fr3-1] OS: Theories and Applications of Evolutionary Algorithms (1)

Dimension Reduction EA for Portfolio Replication Problem: Search Space Change by Fixing Important Variables 22
Yukiko Orito and Yoshiko Hanada

A Study on Stepwise Satisfaction Method of Constraints Based on Difficulty of Constraints 26
Ryo Ooe and Tomohiro Yoshikawa

Evolutionary Algorithmic Parameter Optimization of MOEAs for Multiple Multi-objective Problems 30
Motoaki Kakuguchi, Minami Miyakawa, Keiki Takadama, and Hiroyuki Sato

The Effectiveness of Considering the Intrinsic Characteristics for Nurse Scheduling Problem 36
Junya Inafune and Shinya Watanabe

[Fr4-1] OS: Clustering (1)

On Possibilistic Clustering Algorithms Based on Noise Clustering 42
Yuchi Kanzawa

GS: Decision Making and Risk

Application of the UCT Algorithm for Noisy Optimization Problems 48
Akira Notsu, Satoshi Kane, Seiki Ubukata, and Katsuhiro Honda

A Novel Bipolar MCDM Model Using Rough Sets and Three-Way Decisions for Decision Aids 53
Kao-Yi Shen and Gwo-Hshiung Tzeng

A Subjective and Objective Constructing Approach for Reasonable Membership Function Based on Mathematical Programming 59
Takashi Hasuike and Hideki Katagiri

[Fr5-1] OS: Soft Computing Techniques for Computer Vision

A Least Median of Squares Method Based on Fuzzy Reinforcement Learning for Modeling of Computer Vision Applications 65
Toshihiko Watanabe and Tomoki Ishimaru

Estimation of Camera Projection Matrix Using Linear Matrix Inequalities 72
Yoshimichi Ito and Yuta Oda

Analysis of Rearview Image Sequence of Motorcycle for Defensive Driving 76
Motonori Doi and Junpei Oritate

OS: Action & Behavior Analysis for Surveillance & Other Applications

Tracking Visitors in a Real Museum for Behavioral Analysis 80
Md. Golam Rashed, Ryota Suzuki, Takuya Yonezawa, Antony Lam, Yoshinori Kobayashi, and Yoshinori Kuno

[Fr6-1] OS: Soft Intelligent SoC

Pipeline Labeling Algorithm with Parallel Calculation of Gravity Center on FPGA 86
Masahiro Shimasaki and Yukinobu Hoshino

Evaluation of Optimization Methods for Neural Network 92
Yuto Yasuoka, Yuki Shinomiya, and Yukinobu Hoshino

An-FPGA Based Classification System by Using a Neural Network and an Improved Particle Swarm Optimization Algorithm 97
Tuan Linh Dang and Yukinobu Hoshino

An Analysis of Dependency of Prior Probability for Codebook-Based Image Representation 103
Yuki Shinomiya and Yukinobu Hoshino

[Fr7-1] OS: Application to Managerial Decision Making

Input Quantity Commitment in Vertically Related Industries 109
Joonghwa Oh and Jaewook Kim

Can We Duplicate a Sequential Game with an Asymmetric Simultaneous Game 113
DongJoon Lee

A Study on Analytic Hierarchy Process Structural Design: The Case of the Fixed Income Market Portfolio to Worldwide 118
SangHeon Han

[Fr2-2] OS: Human Activity Estimation by Particle Filters

Motion Prejudgment Dependent Mixture System Noise in System Model for Tennis Ball 3D Position Tracking by Particle Filter 124
Yuan Wang, Xina Cheng, Norikazu Ikoma, Masaaki Honda, and Takeshi Ikenaga

Real-Time Posture Imitation of Biped Humanoid Robot Based on Particle Filter with Simple Joint Control for Standing Stabilization 130
Yo Kondo, Shohei Yamamoto, and Yasutake Takahashi

GS: Multivariate Analysis

Data Compression with Linear Discriminant Analysis 136
Yan Pei

One Missing Value Problem in Latin Square Design of Any Order: Regression Sum of Squares 142
Kittiwat Sirikasemsuk

Study of Multi-distributed Generation Behavior when Fault Occurrence in Distribution System Using Wavelet Transform 148
Santipont Ananwattanaporn and Atthapol Ngaopitakkul

[Fr3-2] OS: Theories and Applications of Evolutionary Algorithms (2)

Probabilistic Model-Based Multistep Crossover for Genetic Programming 154
Kohei Matsumura, Yoshiko Hanada, and Keiko Ono

Extracting Different Abstracted Level Rule with Variance-Based LCS 160
Caili Zhang, Takato Tatsumi, Masaya Nakata, Keiki Takadama, Hiroyuki Sato, and Tim Kovacs

Evaluation of Three Steady-State NSGA-III Offspring Selection Schemes for Many-Objective Optimization 166
Courtney Powell, Phyo Thandar Thant, and Masaharu Munetomo

Effects of Different Implementations of a Real Random Number Generator on the Search Behavior of Multiobjective Evolutionary Algorithms 172
Takahiro Funakoshi, Yusuke Nojima, and Hisao Ishibuchi

[Fr4-2] OS: Rough Sets, Granular Computing and Their Applications (1)

On Apriori-Based Rule Generation in SQL — A Case of the Deterministic Information System 178
Chenxi Liu, Hiroshi Sakai, Xiaoxin Zhu, and Michinori Nakata

Rough Approximations from Indiscernibility Relations under Incomplete Information 183
Michinori Nakata and Hiroshi Sakai

The Rough Set k-Means Clustering 189
Seiki Ubukata, Akira Notsu, and Katsuhiro Honda

A Linguistic Representation Method for Kansei Data 194
Sapa Chanyachatchawan, Hong-Bin Yan, Songsak Sriboonchitta, and Van-Nam Huynh

Investigation of the Relationship between Upper Body Poses and Emotions Using the Evaluation Grid Method 200
Misaki Ogawa, Saerom Lee, and Yoshifumi Okada

[Fr5-2] OS: Marketing Analysis

Utilization of Genetic Algorithm in Allocating Goods to Shop Shelves 204
Yuki Higuchi and Kauzhiro Takeyasu

The Method to Improve Forecasting Accuracy under the Utilization of Neural Network 208
Kazuhiro Takeyasu, Yuki Higuchi, and Yuta Tsuchida

Multivariate Analysis on a Questionnaire Investigation for the Rare Sugars 214
Yasuo Ishii, Hiromasa Takeyasu, Daisuke Takeyasu, and Kazuhiro Takeyasu

OS: Fuzzy Inference Systems

Application to a Medical Diagnosis System by Extended Functional-Type SIRMs Connected Fuzzy Inference Method 220
Diederik van Krieken, Hirosato Seki, and Masahiro Inuiguchi

Position Prediction of Opponent Players by SIRMs Fuzzy Models for RoboCup Soccer 2D Simulation 224
Tomonari Nakade, Tomoharu Nakashima, Hidehisa Akiyama, and Hirosato Seki

[Fr6-2] SS: Social Network Analysis

Iterating Influence in Social Networks 229
Michel Grabisch and Agnieszka Rusinowska

GS: Social Network and Multiagent Systems

Link Prediction in Scientists Collaboration with Author Name and Affiliation 233
Muhammad Ilias Amin and Kazuyuki Murase

Learning Evaluation Function for Decision Making of Soccer Agents Using Learning to Rank 239
Hidehisa Akiyama, Masashi Tsuji, and Shigeto Aramaki

Analysis of Coherence Resonance in Kaldor-Kalecki Business Cycle Model 243
Sou Nobukawa, Ryohei Hashimoto, Haruhiko Nishimura, Teruya Yamanishi, and Masaru Chiba

OS: Social Implementation of Practical and Intelligent Systems (1)

Detecting Cyberbullying with Morphosemantic Patterns 248
Michal Ptaszynski, Fumito Masui, Yoko Nakajima, Yasutomo Kimura, Rafal Rzepka, and Kenji Araki

[Fr2-3] OS: Human Symbolic Systems (1)

Impression of Deformation Face Robots with and without a Soft Skin 256
Hisashi Chihara and Masayoshi Kanoh

Behavior Model for Hearing-Dog Robot 260
Hoshito Kudo, Tomoya Koizumi, Tsuyoshi Nakamura, Masayoshi Kanoh, and Koji Yamada

Effects of Collaborative Learning between Educational-Support Robots and Children who Potential Symptoms of a Development Disability 266
Felix Jimenez, Tomohiro Yoshikawa, Takeshi Furuhashi, Masayoshi Kanoh, and Tsuyoshi Nakamura

A Study on Evaluation Analysis for Products Using Topic Model 271
Shingo Tsukioka, Tomohiro Yoshikawa, and Takeshi Furuhashi

[Fr3-3] GS: Distributed Systems and Evolutionary Computation

Overlay Optimization for Cost Efficient P2P Streaming Service 275
Hidekazu Suzuki, Mianxiong Dong, He Li, Kaoru Ota, and Chaofeng Zhang

Heuristic Task Scheduling with Artificial Bee Colony Algorithm for Virtual Machines 281
Warangkhana Kimpan and Boonhatai Kruekaew

Solving Performances of Piecewise-Linear Particle Swarm Optimizer with Chaotic Dynamics 287
Tomoyuki Sasaki, Hidehiro Nakano, Arata Miyauchi, and Akira Taguchi

Multi-objective Hadoop Configuration Optimization Using Steady-State NSGA-II 293
Phyo Thandar Thant, Courtney Powell, Akiyoshi Sugiki, and Masaharu Munetomo

[Fr4-3] OS: Cognitive Robotics

The Inference of Robot Utterance Timing Based on Vehicle Acceleration Condition 299
Yoshikazu Okajima, Hiroyuki Masuta, Toru Oshima, Ken'Ichi Koyanagi, Tatsuo Motoyoshi, and Eiichi Takayama

Genetic Optimized Fuzzy Extreme Learning Machine Ensembles for Affect Classification 305
Wei Shiung Liew, Chu Kiong Loo, and Takenori Obo

Towards Hand-Object Gesture Extraction from Depth Image 311
Dongxu Gao, Zhaojie Ju, Jiangtao Cao, and Honghai Liu

Health Promotion Using Smart Device Interlocked Robot Partners for Elderly People 317
Siqi Sun, Takenori Obo, Chu Kiong Loo, and Naoyuki Kubota

[Fr5-3] OS: e-Navigation and Its applications

Visualization of Ship Collision Risk Based on Near-Miss Accidents 323
Kwang-Il Kim and Jung Sik Jeong

A Study on the Implementation of Intelligent Navigational Risk Assessment System with IoT Sensor 328
Do-Yeon Kim, Kil-Yong Kim, Gyei-Kark Park, and Jung-Sik Jeong

A Study on Data Model and Prototype for Developing a MSI (Maritime Safety Information) Service 334
Sewoong Oh, Dongwoo Kang, Eivind Mong, and Byungmoon Park

Position Service Integrity Analysis of GPS/DGPS Signals in Port Environment 339
Youngki Kim, Kiyeol Seo, Sanghyun Park, and Tae Hyun Fang

[Fr6-3] GS: Neural Networks

Self-Organizing Maps for Multi-system and Multi-view Datasets 343
Hideaki Ishibashi and Tetsuo Furukawa

Single-Layered Complex-Valued Neural Network with SMOTE for Imbalanced Data Classification 349
Kentarou Matsuda and Kazuyuki Murase

On the Parameter Setting of a Network-Growing Algorithm for Radial Basis Kernel Networks 355
Tetsuya Hoya

Improvement of Sensory Information Processing by Balancing Tonic and Phasic Subthreshold Neuronal Excitation 360
Asahi Ishiyama, Hiroakira Matsui, Kazuhiro Tsuboi, Kazuo Watanabe, and Osamu Hoshino

[Sa2-1] OS: Multimedia Revolution

An Efficient Random Unitary Matrix for Biometric Template Protection 366
Yuko Saito, Ibuki Nakamura, Sayaka Shiota, and Hitoshi Kiya

An Interactive Speech Synthesizer Developed with Pure Data and Touch OSC 371
Naofumi Aoki and Keisuke Ai

A Disaster Prevention Broadcasting Based on Audio Data Hiding Technology 373
Tetsuya Kojima, Kan Kamada, and Udaya Parampalli

Review-Based Service Profiling and Recommendation 377
Toshihiko Yamasaki, Masafumi Yamamoto, and Kiyoharu Aizawa

[Sa3-1] OS: Intelligent Robotics and Vehicle System

Active Steerable Driving Mechanism Using Two In-Wheel Motors for Omnidirectional Motion of Robotic Mobile Platform 382
Young-Jae Ryoo, Susan Park, Yong-Jun Lee, and Kyung Seok Byun

Robot Sports Game and Its Strategy as Intelligent System and Soft Computing 386
Young-Jae Ryoo, Ki-Nam Lee, Woo-Ram Gil, Dae-Yeong Im, and Da-Jung Yoon

Dynamic Simulation of Caster Wheel Considering Initial Steering Angle 389
Seungyoung Yang, Pilgu Lee, Young-Jae Ryoo, and Kyung Seok Byun

OS: Soft Computing to Real World Application

Decision Tree Ensemble Classifiers for Anomalous Propagation Echo Detection 391
Hansoo Lee and Sungshin Kim

An Application of Fuzzy Time Series Forecasting 397
Jin Hee Yoon and Joocheol Kim

[Sa4-1] OS: Clustering (2)

Hierarchical and Non-Hierarchical Medoid Clustering Using Asymmetric Similarity Measures 400
Sadaaki Miyamoto, Yousuke Kaizu, and Yasunori Endo

A Note on Even-Sized Clustering Based on Optimization 404
Tsubasa Hirano, Yasunori Endo, Naohiko Kinoshita, and Sadaaki Miyamoto

A Method of Two-Stage Clustering Based on Cluster Validity Measures 410
Ryo Ozaki, Yukihiro Hamasuna, and Yasunori Endo

On Kernelized Sequential Hard Clustering 416
Yukihiro Hamasuna and Yasunori Endo

Families of Triangular Norm Based Kernel Function and Its Application to Kernel k-Means 420
Kazushi Okamoto

[Sa5-1] OS: Brain Computing and Embodies Knowledge (1)

Study on Monitoring Method Using a Wrist Watch Type Device for Unsafe Behavior 426
Michiyuki Hirokane and Kenta Kamijo

Experiment of Disaster Prevention Education and Evaluation Using a Torrential Rain Simulated Experience Application 432
Michiyuki Hirokane, Kazuaki Nishiwaki, and Takahiro Endo

Spatiotemporal Human Brain Activities on Recalling Fruit Names 438
Koji Sugimoto, Takahiro Yamanoi, Hisashi Toyoshima, Mika Otsuki, Shin-Ichi Ohnishi, and Toshimasa Yamazaki

Analysis of Air Flow and Chest Volume for Sleep Apnea 442
Douglas E. Dow, Jacob G. Reed, and Marilyn Urrea

Correlation of Brain Activity and Questionnaire at the Decision-Making 445
Keita Mitani and Yukinobu Hoshino

[Sa6-1] OS: Intelligent Systems and Its Applications

Design of Fuzzy Logic System for Position Control of Quad-Copter 449
Hyun-Ho Yoo, Han Sang Kim, and Byung-Jae Choi

Design of Fuzzy Sliding Mode Controller for Maglev Transportation System 451
Tran Huu Luat and Yong-Tae Kim

Performance Evaluation of Big Data Technology on Designing Big Network Traffic Data Analysis System 454
Nattawat Khamphakdee, Nunnapus Benjamas, and Saiyan Saiyod

GS: Fault Detection and Diagnosis

[Sa7-1] GS: Transportation Systems

A Reinforcement Learning Based Dynamic Power Management for Fuel Cell Hybrid Electric Vehicle 460
Roy Chaoming Hsu, Shi-Mao Chen, Wen-Yen Chen, and Cheng-Ting Liu

Comparison of Objective Function Evaluators for a Stochastic Orienteering Problem 465
V. Papapanagiotou, R. Montemanni, and L. M. Gambardella

OS: Soft Computing in Urban and Transport Planning

Multi-agent Simulation of Commuting Modal Shift Considering with Health Conscious 472
Masashi Okushima

Debris Treatment Planning for Large-Scale Earthquakes Using Fuzzy Information 478
Hiroaki Inokuchi and Takamasa Akiyama

Application of Fuzzy Decision Tree to Analyze the Attitude of Citizens for Wellness City Development 484
Takamasa Akiyama and Hiroaki Inokuchi

[Sa2-2] OS: Intelligent Systems Based on Bio-signal Processing and Human Behavior Analysis

Emotional Face Retrieval with P300 Signals of Multiple Subjects 490
Junwei Fan and Hideaki Touyama

Effectiveness of Tangible Programming Tool Using RFID System 496
Tatsuo Motoyoshi, Naomi Tetsumura, Hiroyuki Masuta, Ken'Ichi Koyanagi, Toru Oshima, and Hiroshi Kawakami

Tangible Programming Tools Equipping RFID System 500
Naoki Tetsumura, Tatsuo Motoyoshi, Toru Oshima, Ken'Ichi Koyanagi, Hiroyuki Masuta, and Hiroshi Kawakami

Consideration of the Experience of a Blind User Using a Tactile Graphics Editor Available for Blind People 504
Yuji Masaki, Tatsuo Motoyoshi, and Noboru Takagi

Development of Measurement Method of Pupil Diameter under Visible-Light Condition 508
Yuki Morita, Hironobu Takano, and Kiyomi Nakamura

[Sa3-2] OS: Robotics for Socio Synthesis

Adaptive Color Tracking for Particle Filter to Control a Drone in a Forest 512
Keiji Kamei, Kazu Narumi, and Daisuke Shuto

Mathematical Modeling and Motion Analysis of the Wheel Based Ball Retaining Mechanism 518
Kenji Kimura, Kazuo Ishii, Yasunori Takemura, and Motoji Yamamoto

Depth-Based Visual Servoing Using Low-Accurate Arm 524
Ludovic Hofer, Michio Tanaka, Hakaru Tamukoh, Amir Ali Forough Nassiraei, and Takashi Morie

Motion Analysis and Control of the Ball Operation for Dribbling Action in RoboCup Soccer Robot 532
Shota Chikushi, Tharindu Weerakoon, Kazuo Ishii, and Takashi Sonoda

Tomato Harvesting Robot Competiton 537
Kazuo Ishii, Yasunori Takemura, Takayuki Matsuo, and Takashi Sonoda

[Sa4-2] OS: Rough Sets, Granular Computing and Their Applications (2)

Improvement of Item-Based Collaborative Filtering by Adding Time Factor and Covering Degree 543
Zhipeng Zhang, Yasuo Kudo, and Tetsuya Murai

Variety of Rough Set Based Attribute Importance 548
Masahiro Inuiguchi

OS: Interval/Fuzzy Models for Multiple Criteria Decision Making

Improvement of Interval Weight Estimation in Interval AHP 552
Shigeaki Innan and Masahiro Inuiguchi

Individual Decisions Affected by Group Decision Based on Surely Assigned Weight 558
Tomoe Entani

Consistent Fuzzy Analytic Hierarchy Process by Considering Fuzzy Input and Output Data 564
Jih-Jeng Huang

[Sa5-2] OS: Brain Computing and Embodies Knowledge (2)

An Analysis for Switching of Feedback and Feedforward Mechanism in Motor Internal Model 570
Isao Hayashi, Sayaka Kita, Masaki Ogino, and Jasmin Leveille

Does Representation of Outer Objects in Living Neuronal Network Synthesize “the concept”? 576
Eri Shibata, Hidekatsu Ito, Wataru Minoshima, and Suguru N. Kudoh

Extraction and Investigation of Dominant Eye-Gaze Pattern in Train Driver’s Visual Behavior Using Markov Cluster Algorithm 578
Yukio Horiguchi, Takaya Suzuki, Tetsuo Sawaragi, Hiroaki Nakanishi, and Tomoharu Takimoto

OS: Decoding and Control of Biological System (1)

Input-Output Transformation of a Neuronal Oscillator 582
Takanobu Yamanobe

Maximum Entropy Learning in Cultured Cortical Neural Networks 584
Takuya Isomura, Kiyoshi Kotani, and Yasuhiko Jimbo

[Sa6-2] Social Implementation of Practical and Intelligent Systems (2)

Smart Device Interlocked Robot Partners for Information Support Systems in Sightseeing Guide 586
Siqi Sun, Takahiro Takeda, Hisae Koyama, and Naoyuki Kubota

A Validity Analysis of a User Model Employed in a Research Activity Support System 591
Daisuke Kitakoshi, Shunya Toda, and Masato Suzuki

Development of a Pedestrian Navigation System for the Visually Impaired with QZSS and RFID 598
Akihiro Yamashita, Kei Sato, Syunta Sato, and Katsushi Matsubayashi

GS: Story Generation and Summarization

Multi-document Summarization by Creating Synthetic Document Vector Based on Language Model 605
Dahae Kim and Jee-Hyong Lee

Generate Causal Story Plots by Monte Carlo Tree Search Based on Common Sense Ontology 610
Von-Wun Soo, Tai-Hsun Chen, and Chi-Mou Lee

[Sa7-2] GS: Kansei Engineering and Interface

A Moral Judgment System Using an Automatic Created Moral Corpus 616
Masahiro Yamamoto and Masafumi Hagiwara

Analysis of Images of Streetscapes by Text Data and Comparison between Residents and Visitors 622
Kohei Nomoto and Naruki Noguchi

Music Recommendation System Improvement Using Distributed Genetic Algorithm 627
Masayoshi Inoue, Hiroshi Takenouchi, and Masataka Tokumaru

Interruption-Information Management Framework for Chat Interface 631
Shreejana Prajapati, Koichi Yamada, Muneyuki Unehara, and Izumi Suzuki

Interactive Voice Generation System for Story Reading 637
Takehisa Onisawa and Kiriko Ogino

[Sa2-3] OS: Human Symbolic Systems (2)

Gaze Instruction System Used Panoramic Expansion Image of Omnidirectional Camera 643
Yoichiro Maeda and Kazuki Naruki

Power Assist Control Based on Motion Estimation of Wearer's Forearm Using Motion Sensor 649
Katsuya Sahashi, Shinnosuke Nomura, Takuya Inoue, Yasutake Takahashi, Yoshiaki Taniai, and Masayuki Kawai

Verifying Effectiveness of a Handwriting Robot Using Onomatopoeia 655
Kazuya Endo, Masayoshi Kanoh, and Tsuyoshi Nakamura

Adobe Illustrator Plug-In to Support Brush Selection Using Onomatopoeia Utterance 659
Gou Kayama, Masato Yoshiike, Yuri Yamada, Tsuyoshi Nakamura, Masayoshi Kanoh, and Koji Yamada

OS: IoT Security and Its Application

Development of a Customized User Control of Digital Audio in a Smart Home 665
Jung-Sook Kim

[Sa3-3] OS: Novel Media in Ubiquitous Virtual Reality

3D Printing Simulation Tool for Future 3D Printing Environment 669
Choonsung Shin and Sang-Won Lee

Position and Force Sensitive N-Ary User Interface Framework for Wrist-Worn Wearables 671
Hyoseok Yoon, Ji-Eun Lee, Se-Ho Park, and Kyung-Taek Lee

Survey on Interactive AR Book 676
Choonsung Shin, Sehwan Kim, and Youngho Lee

GS: Modeling and Simulation

Comparative Experiments on Models for Automatic Baseball Video Tagging 678
Komei Arasawa and Shun Hattori

[Sa4-3] OS: Clustering (3)

A Study on Recommendation Ability in Collaborative Filtering by Fuzzy Co-Clustering with Exclusive Item Partition 686
Takaya Nakano, Katsuhiro Honda, Seiki Ubukata, and Akira Notsu

Cluster Validation in Multinomial Mixtures-Induced Fuzzy Co-Clustering 690
Katsuhiro Honda, Yurina Suzuki, Seiki Ubukata, and Akira Notsu

A Noise Fuzzy Co-Clustering Scheme in MMMs-Induced Clustering 695
Katsuhiro Honda, Nami Yamamoto, Seiki Ubukata, and Akira Notsu

GS: Pattern Recognition

Approximate Determination of q-Parameter for FCM with Tsallis Entropy Maximization 700
Makoto Yasuda

Reversible Data Hiding with Prediction-Based Multi-bit Embedding and Multi-level Difference Alteration 706
Hsiang-Cheh Huang, Feng-Cheng Chang, and Yuh-Yih Lu

[Sa5-3] OS: Decoding and Control of Biological System (2)

Development of Gait Assistive Device Using Pneumatic Artificial Muscle 710
Yusuke Hashimoto, Yasutaka Nakanishi, Norihiko Saga, Jun-Ya Nagase, and Toshiyuki Satoh

Attempt on the Extraction of EEG Using the ECG at the Time of Walking and Stepping Motion 714
Kikuo Fujimura and Syohei Okazaki

Development of Wearable Force Plate 718
Ken Oi, Yasutaka Nakanishi, Norihiko Saga, and Kunio Shimada

Comparison of Prefrontal Activity Evoked by Limbic Movement, Motor Imagery and Transcranial Magnetic Stimulation (TMS) 720
Sayaka Morishita, Hidekatsu Ito, and Suguru N. Kudoh

Relationships between Stimulus Interval and Changes of Firing Properties 722
Hidekatsu Ito, Wataru Minoshima, and Suguru N. Kudoh

[Sa6-3] OS: Intelligent Smart City

Stixel-Based Stereo Vision for Real-Time ADAS 724
Taekang Woo, Seungsoo Kim, Hyoungrae Kim, Eunsoo Park, and Hakil Kim

Intelligent Unmanned Aerial Vehicle Platform for Smart Cities 729
Andrey Giyenko and Young Im Cho

GS: Smart City

Development of Reporting Tool for Supporting Language Disorder Diagnosis 734
Moonsoo Chang, Tae-Kyoon Choi, and Min-Ho Yoo

Smart Grid Framework Test Bed Using OPNET and Power Line Communication 736
Jun-Ho Huh and Kyungryong Seo

Regional Revival through IoT Enabled Smart Tourism Process Framework (STPF): A Proposal 743
Bishnu Prasad Gautam, Hiroyasu Asami, Amit Batajoo, and Tatsuya Fujisaki

[Sa7-3] OS: Synthesis of Computational Intelligence Technologies and Methodological Design

Design of Classification of Black Plastics Based on Fuzzy Radial Basis Fnction Neural Networks Using Raman Spectroscopy 749
Jong-Soo Bae, Sung-Kwun Oh, and Eun Ok Kim

Design of Face Recognition System Realized with the Aid of PCA-Based RBFNN 754
Sun-Hwan Kim, Sung-Kwun Oh, and Jin-Yul Kim

Design of Interval Type-2 FCM-Based Neural Networks 759
Wook-Dong Kim, Sung-Kwun Oh, and Kisung Seo

Design of Radial Basis Function Neural Networks with Principal Component Analysis and Linear Discriminant Analysis for Black Plastic Identification 764
Seok-Beom Roh, Sung-Kwun Oh, Eun Kyu Park, and Woo Zin Choi

Polynomial Neural Network Classifiers Based on Data Preprocessing and Space Search Optimization 769
Wei Huang, Sung-Kwun Oh, and Witold Pedrycz

[Su2-1] OS: Practical Applications of Intelligent Systems (1)

Intuitionistic Fuzzy Approximation Spaces Induced by Intuitionistic Fuzzy Topologies 774
Sang Min Yun and Seok Jong Lee

Fast Generative Approach Based on Sparse Representation for Visual Tracking 778
Suryo Adhi Wibowo, Hansoo Lee, Eun Kyeong Kim, and Sungshin Kim

[Su3-1] OS: Interactive Systems (1)

Interactive Projection System That Always Presents Information within User's View 784
Jun-Ichi Imai, Ryota Kobayashi, Kazuya Jinjo, Hirobumi Suzuki, Kazuto Kameda, Shohei Koshikawa, and Seiya Takihara

Development of a Breathing Detection Robot for a Monitoring System 790
Tsukasa Ushijima and Junji Satake

Calibrating Screen Coordinates of Tabletop Display Using a Shadow Cursor and Its Properties 796
Makio Ishihara and Yukio Ishihara

[Su4-1] OS: Fuzzy Intelligent Systems (1)

Design and Implementation of a Interval Type-2 Adaptive Fuzzy Controller for a Novel Pneumatic Active Suspension System 801
Yi-Hsun Lo, Rui-Peng Chen, Lian-Wang Lee, I-Hsum Li, and Ya-Dung Pan

A Novel Approach for Linear Interval Regression Models with Fuzzy Weights 806
Jin-Tsong Jeng, Chih-Ching Hsiao, Chen-Chia Chuang, Chih-Wen Li, Chen-Xiang Zhang, and Chih-Chi Lin

Chaos Synchronization Using Brain-Emotional-Learning-Based Fuzzy Control 811
Chun-Fei Hsu, Chien-Ting Su, and Tsu-Tian Lee

[Su5-1] OS: Advanced Biomedical Engineering

Filtering Effects for Image Data Types in Image Analysis Using Subspace Classifier 817
Nobuo Matsuda, Fumiaki Tajima, and Hideaki Sato

A Development of Evaluation System for Pelvic Belt by Using Force Sensor 822
Kouki Nagamune and Keisuke Oe

Implanted Knee Kinematics Analysis by 2-D/3-D Registration Using Particle Filter 827
Kento Morita, Manabu Nii, Fumiaki Imamura, Takatoshi Morooka, Shinichi Yoshiya, and Syoji Kobashi

[Su6-1] OS: Intelligent Sensors and Its Application

Preliminary Study for Biometric Based on Gait Pattern Analysis Using Insole-Type Force Sensor 832
Hangsik Shin, Hwa Young Jung, and Se Dong Min

Development of RFID Reader and BLE Module for Pole Management Using Smart Phone 835
Jaepyoung Kim, Youngchul Bae, and Young Woo Shon

Approximation-Free Observer for Underactuated Surface Vessels 838
Bong Seok Park

[Su2-2] OS: Practical Applications of Intelligent Systems (2)

Recurrent Neural Network for Storytelling 841
YunSeok Choi, SuAh Kim, and Jee-Hyong Lee

Collective Matrix Factorization Using Tag Embedding for Effective Recommender System 846
Hanbyul Bang and Jee-Hyong Lee

Analysis on Toddlers' Mean Length of Utterance and Type-Token Ratio by Their Gender and Maternal Conversational Style 851
Miyoung Sung, Young Eun Chang, and Moon Soo Chang

[Su3-2] OS: Interactive Systems (2)

Do You Follow Angel Agent's Advice?: A Pilot Study for Decision Making Support by Multiple Animated Agents 853
Masahide Yuasa and Daiki Morimoto

Performance Evaluation of a Kansei Retrieval Agent Model with Neural Networks 857
Hiroshi Takenouchi and Masataka Tokumaru

Creation of Warning Sound by Vote of Multiple Users Based on Interactive Differential Evolution: Discussion toward Effective IECs Creating of Media Contents Suited to Multiple Users 862
Makoto Fukumoto

[Su4-2] OS: Fuzzy Intelligent Systems (2)

iOS-Based People Detection of Multi-object Detection System 868
Ze-Si Huang, Chen-Chia Chuang, C. W. Tao, Min-Yeh Hsieh, Chen-Xiang Zhang, and Chia-Wen Chang

A Novel Steering Control via Gravity Position: Vehicle Control by Driver's Seat 874
Chung-Neng Huang, Jenn-Kun Kuo, and Chen-Chia Chuang

SoPC-Based Evolutionary BFO Computing and Its Application to Tracking Control of Mecanum Mobile Robots 878
Hsu-Chih Huang, Chin-Wang Tao, Chang-Han Wu, and Jin-Tsong Jeng

[Su5-2] OS: New Generation Computing Paradigm

A Generation Gap Model for a Human-Based Evolutionary Algorithm Using a Tag Cloud 880
Masatomo Azumaya and Kei Ohnishi

Solving Subset Sum Problem Using EN P System with Active Membranes 886
Tomohiro Shiiba and Akihiro Fujiwara

Experimental Evaluation of Approximation Algorithms for Maximum Distance-Bounded Subgraph Problems 892
Yuichi Asahiro, Tomohiro Kubo, and Eiji Miyano

Poster Session

Large Graph Reconstruction Method for Fast Graph Analysis on Spark 898
Ryota Takei and Ayahiko Niimi

On Reward Function for Survival 902
Naoto Yoshida

Action Selection Using Each Task Priority: Realization of Asynchrony Action Selection and Update Priorities 908
Takuya Masaki and Kentarou Kurashige

Rating-Scale Questionnaire Survey Analysis Using SOM-Based Nonlinear Tensor Decomposition 912
Hideaki Ishibashi, Tohru Iwasaki, Yohsuke Date, and Tetsuo Furukawa

Automatic Detection and Manual Analysis of Inadequate Descriptions in a Thesis 916
Takuma Okada, Masaki Murata, and Qing Ma

Application of Kansei Engineering and Analytic Network Process in the Thai Ceramic Design 922
Chaiwat Kittidecha and Koichi Yamada

Workings of the Brain in the Time Perception Using the Time Guessing Game 929
Ryosuke Hayasaka, Keita Mitani, and Yukinobu Hoshino

Discussion of Sensor Accuracy Introducing to Machine Learning with Model Car 932
Hisayuki Sasaoka

A Quality Classification Model for Word of Mouth via a Content-Based Sentiment Lexicon 934
Chihli Hung and Rui-Jia Zhong

Mining Correlated Association Rules from Multi-relational Data Using FCA 938
Masahiro Nagao and Hirohisa Seki

Writer Identification Using Skeleton-Based Shape Feature of Hand Holding a Pen 942
Midori Tanaka and Mitsuru Nakai

Feature Extraction of English Textbooks for Elementary School Children in Finland 944
Hiromi Ban, Haruhiko Kimura, and Takashi Oyabu

Walking Activity Estimation Method by Using Electrostatic Induction 949
Koichi Kurita

Logics in Granular Computing 951
Tuan-Fang Fan and Churn-Jung Liau

Object Detection Using Color Entropy-Based Fuzzy Classifier With Expanded Consequent Space 955
Guo-Cyuan Chen, Chia-Feng Juang, and I-Fang Chung

Comparison of Water Quality Classification Models Using Artificial Neural Network and Bayesian Network 958
Chamara P. Liyanage and Koichi Yamada

Analysis of Fundamental and Harmonic Frequency Components in Photic Driving Response 962
Yuto Abe, Tadanori Fukami, Takamasa Shimada, and Fumito Ishikawa

Japanese Word Sense Disambiguation Using Paraphrasing and Machine Learning 966
Yuma Toda, Masaki Murata, and Qing Ma

Visualizing States by Autoregressive Gaussian Process Dynamical Models 972
Nobuhiko Yamaguchi

A Modification of Weighted k-Nearest Neighbor and Its Application to Land-Cover Classification with Remote-Sensing Image 976
Ryosuke Kubota and Tatsuya Hayashi

High Quality 3D Color Imaging for Gesture Recognition 979
Jing-Wein Wang, Tzu-Hsiung Chen, and Quynh Anh Vu

Effective Estimation Method of P300 and SSVEP in Hybrid BCI 983
Ryota Mihira, Takuya Suzuki, Ryota Sawaki, Tadanori Fukami, and Fumito Ishikawa

A Hybrid Method of CT Algorithms Using Total Variation, Iterative FT and Support Construction 989
Wisan Dhammatorn and Hiroyuki Shioya

Effects of Acoustical Noise on Selective Attention to Auditory Stimuli During Intellectual Task 993
Takahiro Tamesue

Source Code Representation Using Statement Relation Long Short-Term Memory Networks 997
Suah Kim and Jee-Hyong Lee

Feature Selection for On-Line Signature Verification Using Dynamic Features 1001
Kotaro Nakano and Basabi Chakraborty

Adaptive Refocusing Algorithm Design Based on 3D Depth Image 1005
Yu-Cheng Fan and Wei-Syuan Chen

Author Index