

# **17th International Conference in Knowledge Based and Intelligent Information and Engineering Systems**

## **(KES 2013)**

**Procedia Computer Science Volume 22**

**Kitakyushu, Japan  
9-11 September 2013**

**Part 1 of 2**

**Editors:**

**Junzo Watada  
Robert J. Howlett  
Koichi Asakura**

**Lakhmi C. Jain  
Naoto Mukai**

**ISBN: 978-1-62993-662-8**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© by Elsevier B.V.  
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact Elsevier B.V.  
at the address below.

Elsevier B.V.  
Radarweg 29  
Amsterdam 1043 NX  
The Netherlands

Phone: +31 20 485 3911  
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)



Available online at www.sciencedirect.com

**ScienceDirect**

Procedia Computer Science 22 (2013) iii-viii

---

---

**Procedia**  
Computer Science

---

## Contents

Preface.....	1
A Biologically Inspired Decision Model for Multivariable Genetic-fuzzy-AHP System I. Kouatli .....	2
A Method to Share Word Knowledge of Dependability Case M. Matsumura, V. Patu, Y. Matsuno, S. Takama, T. Tokuno, S. Yamamoto .....	10
A Neural Network Approach for Non-contact Defect Inspection of Flat Panel Displays H.A. Abeysundara, H. Hamori, T. Matsui, M. Sakawa .....	20
A New Method of Using Physical Effects in Su-field Analysis based on Ontology Reasoning W. Yan, C. Zanni-Merk, F. Rousset, D. Cavallucci, P. Collet .....	30
AIC-An AI-system for Combination of Senses A. Håkansson .....	40
Application of Genetic Algorithms to Fine-gain Tuning of Improved the Resolved Acceleration Controller A. Otsuka, F. Nagata .....	50
Applying $2^k$ Factorial Design to Assess the Performance of ANN and SVM Methods for Forecasting Stationary and Non-stationary Time Series K. Kandananon .....	60
CHRONOS: A Reasoning Engine for Qualitative Temporal Information in OWL E. Anagnostopoulos, S. Batsakis, E.G.M. Petrakis .....	70
Combining Lexical and Semantic Features for Short Text Classification L. Yang, C. Li, Q. Ding, L. Li .....	78
Decision Rules, Trees and Tests for Tables with Many-valued Decisions-comparative Study M. Azad, B. Zielosko, M. Moshkov, I. Chikalov .....	87
Design and Implement a Knowledge Management System to Support Web-based Learning in Higher Education J. Peng, D. Jiang, X. Zhang .....	95
Development of Customer Satisfaction Models for Affective Design Using Rough Set and ANFIS Approaches H. Jiang, C.K. Kwong, M.C. Law, W.H. Ip .....	104
Discusys: Multiple User Real-time Digital Sticky-note Affinity-diagram Brainstorming System W. Widjaja, K. Yoshii, K. Haga, M. Takahashi .....	113
Dual Decomposition for Vietnamese Part-of-Speech Tagging N.X. Bach, K. Hiraishi, N. Le Minh, A. Shimazu .....	123
Exploitation of Query Sentences Using Specific Weighting in Support-sentence Retrieval H.-M. Nguyen, K. Shirai .....	132
Feature based Summarization of Customers' Reviews of Online Products K. Bafna, D. Toshniwal .....	142
Floating Point Arithmetic Protocols for Constructing Secure Data Analysis Application Y.-C. Liu, Y.-T. Chiang, T.-S. Hsu, C.-J. Liau, D.-W. Wang .....	152
Hierarchical Multiobjective Fuzzy Random Linear Programming Problems H. Yano, K. Matsui .....	162
Hybrid Multi-layered GMDH-type Neural Network Using Principal Component Regression Analysis and its Application to Medical Image Diagnosis of Liver Cancer T. Kondo, J. Ueno, S. Takao .....	172
Identifying Customer Preferences about Tourism Products Using an Aspect-based Opinion Mining Approach E. Marrese-Taylor, J.D. Velásquez, F. Bravo-Marquez, Y. Matsu .....	182
Image Boundary Detection Using the Modified Level set Method and a Diffusion Filter S. Anam, E. Uchino, N. Suetake .....	192
Individual Reinforcement and Social Reinforcement: Analytical Model of Individual Behavior in Social Context E.S. Kitamura, H. Sato, A. Namatame .....	201
Integrating Robot Task Planner with Common-sense Knowledge base to Improve the Efficiency of Planning A. Al-Moadhen, R. Qiu, M. Packianather, Z. Ji, R. Setchi .....	211
Interactive Multi-objective Route Planning for Sightseeing on Time-expanded Networks under Various Conditions T. Hasuike, H. Katagiri, H. Tsubaki, H. Tsuda .....	221
Interlinking Documents based on Semantic Graphs B.P. Nunes, R. Kawase, B. Fetahu, S. Dietze, M.A. Casanova, D. Maynard .....	231
Intra-agent Explanation Using Temporal and Extended Causal Maps A.H. Sbaï, W.L. Chaari, K. Ghédira .....	241

Linguistic Markers in the Sentence Writing Question of the Mini-mental State Examination for Discrimination between Alzheimer's and Vascular Dementia	250
D. Todorov, R. Setchi, A. Bayer	250
Method of Embodying the Meaning of Headlines Using News Articles	260
M. Imono, E. Yoshimura, S. Tsuchiya, H. Watabe	260
Neural Networks with Comparatively Few Critical Points	269
T. Nitta	269
On a Serendipity-oriented Recommender System based on Folksonomy and its Evaluation	276
H. Yamaba, M. Tanoue, K. Takatsuka, N. Okazaki, S. Tomita	276
Ontology based Image Retrieval Framework Using Qualitative SemanticImage Descriptions	285
S. Sarwar, Z.U. Qayyum, S. Majeed	285
Optimization of Approximate Inhibitory Rules Relative to Number of Misclassifications	295
F. Alsolami, I. Chikalov, M. Moshkov, B. Zielosko	295
Personalized Music Recommendation by Mining Social Media Tags	303
J.-H. Su, W.-Y. Chang, V.S. Tseng	303
Pertinent user Profile based on Adaptive Semi-supervised Learning	313
R.Z. Rebaï, L. Ghorbel, C.A. Zayani, I. Amous	313
Rich Presence Information in Agent based Machine-to-Machine Communication	321
M. Kusek, I. Lovrek, H. Maracic	321
Semi-structured Documents Mining: A Review and Comparison	330
A. Madani, O. Boussaid, D.E. Zegour	330
SOAda: Service Oriented Architecture with a Decision Aspect	340
F. Boumahdi, R. Chalal	340
Socializing Entrepreneurship	349
B. Apolloni, G. Galliani, C. Zizzo, F. Epifania, L. Crosta, I. Cesareo	349
Totally Optimal Decision Trees for Monotone Boolean Functions with at Most Five Variables	359
I. Chikalov, S. Hussain, M. Moshkov	359
Tracking Method in Consideration of Existence of Similar Object around Target Object	366
G. Watanabe, S. Fukui, Y. Iwahori, M.K. Bhuyan, R.J. Woodham, Y. Adachi	366
Unsupervised Emotional Scene Detection for Lifelog Video Retrieval based on Gaussian Mixture Model	375
H. Nomiya, A. Morikuni, T. Hochin	375
Unsupervised SIFT-based Face Recognition Using an Automatic Hierarchical Agglomerative Clustering Solution	385
T. Barbu	385
Usage of Diagnostic Simulator for Ground Engineering Crew Training	395
P. Mądrzycki, D. Karczmarz, P. Golański	395
Use of both Invisible and Emergable Watermarks to Deter Illegal Copying of Images	401
T. Yamada	401
User Profile and Multi-criteria Decision Making: Personalization of Traveller's Information in Public Transportation	411
S. Moussa, M. Soui, M. Abed	411
User-oriented RT Service Proposal System in Kukanchi	421
A. Ohira, N.T. Lam, M. Mizukawa, Y. Ando, T. Yoshimi	421
Version Management of the Dynamic Teaching Materials	430
G.M.T. Batista, M. Urata, T. Yasuda	430
A Bio-inspired Architecture of a Motor Neuron System for Virtual Creatures: Movement of a Single Limb with a Single Muscle	440
D. Madrigal, G. Torres, J.L. Del Valle, F. Ramos	440
A Conceptual Model of Trademark Retrieval based on Conceptual Similarity	450
F.M. Anuar, R. Setchi, Y.-K. Lai	450
A Construction Method of Fuzzy Classifiers Using Confidence-weighted Learning	460
T. Nakashima, T. Sumitani, A. Bargiela	460
A Conversion Method from an ETSC to a Timed Petri Net to Improve the Matrix-based Discrete Event Controller and its Unified Support System	467
H. Yamaba, S. Kitano, K. Takatsuka, T. Katayama, N. Okazaki, S. Tomita	467
A Greedy Algorithm for $k$ -Member Co-clustering and its Applicability to Collaborative Filtering	477
A. Kawano, K. Honda, H. Kasugai, A. Notsu	477
A Long-term Data Collection System for Life Pattern Sensor	485
N. Kushiro, T. Ide, M. Katsukura, T. Higuma	485
A Map Construction System for Disaster Areas based on Ant Colony Systems	494
K. Asakura, K. Fukaya, T. Watanabe	494
A Mass Data Update Method in Distributed Systems	502
T. Kudo, Y. Takeda, M. Ishino, K. Saotome, N. Kataoka	502
A Method for the Identification of Multiple Blocked Locations in a Microreactor without a Combinatorial Explosion of CFD Simulations for Database Construction	512
M. Noda	512

A Method of Creating Testing Pattern for Pair-wise Method by Using Knowledge of Parameter Values S. Masuda, T. Matsuodani, K. Tsuda .....	521
A Preliminary Examination of the Effect of White and Blue Backgrounds on Web-based English Listening Tests A.K. Yamazaki, H. Shimada, K. Eto .....	529
A Preliminary Study of the Number of Votes under Majority Rule in Crowdsourcing Y. Okubo, T. Kitasaka, M. Arisugi .....	537
A Support System for Generating SCORM Compliant Open Source Software Usage Manuals A.S. Hadi, T. Yukawa, Y. Murakami .....	544
A Test Analysis Method for Black Box Testing Using AUT and Fault Knowledge T. Yumoto, T. Matsuodani, K. Tsuda .....	551
A TV Program Recommender Framework N. Chang, M. Irvan, T. Terano .....	561
A Warning System in e-learning Using Web Cameras K. Takahashi, K. Arita .....	571
Adaptive Soft Sensor Model Using Online Support Vector Regression with the Time Variable and Discussion on Appropriate Parameter Settings H. Kaneko, K. Funatsu .....	580
An Automatic Segmentation of Bone Tunnels after Anterior Cruciate Ligament Reconstruction in MDCT Image Using K-means Clustering Y. Uozumi, K. Nagamune, D. Araki, Y. Hoshino, R. Kuroda, M. Kurosaka .....	590
An Effective Method for Habitual Behavior Extraction from the Internet N. Suzuki, K. Tsuda .....	599
An Introduction of a Tag Ratio Model and the Classification Examination for Recommender Systems K. Yamauchi, N. Toma, Y. Akamine, K. Yamada, S. Endo .....	606
An Overview of the getRNIA System for Non-deterministic Data M. Wu, M. Nakata, H. Sakai .....	615
Application Methods for Genetic Algorithms for the Search of Feed Positions in the Design of a Reactive Distillation Process L.K. Tun, H. Matsumoto .....	623
Automatic Paper-to-Reviewer Assignment, based on the Matching Degree of the Reviewers X. Li, T. Watanabe .....	633
Automation of Message Handling in Cloud-based Managed Service D. Yamada, Y. Kuwata, R. Kasai, T. Nakamura .....	643
Baseball Coaching Ability Development System based on Externalization of Decision Process T. Matsumoto, T. Kojiri .....	653
Botnet Detection with Event-driven Analysis J. Ersson, E. Moradian .....	662
Characterization of Dynamics of Stable Matchings: Attractors Mapped from Stable Matchings Y. Ishida, T. Sato .....	672
Cloud based Secure and Privacy Enhanced Authentication & Authorization Protocol U. Khalid, A. Ghafoor, M. Irum, M.A. Shibli .....	680
Comparison of ITSS Definition and a Questionnaire to Software Engineer's Skill Improvement R. El-Agamy, C. Morimoto, K. Tsuda .....	689
Computational Techniques for Characterizing Cognition Using EEG Data – New Approaches N. Nandagopal, R. Vijayalakshmi, B. Cocks, N. Dahal, N. Dasari, M. Thilaga, S. Shamshu Dharwez .....	699
Data Jackets for Synthesizing Values in the Market of Data Y. Ohsawa, H. Kido, T. Hayashi, C. Liu .....	709
Detecting Eye Blinking of a Real-world Student and Introducing to the Virtual e-Learning Environment A.D. Dharmawansa, K.T. Nakahira, Y. Fukumura .....	717
Detection of Cyber-Attacks with Zone Dividing and PCA T. Morita, S. Yogo, M. Koike, T. Hamaguchi, S. Jung, I. Koshijima, Y. Hashimoto .....	727
Development of a Typing Skill Learning Environment with Diagnosis and Advice on Fingering Errors M. Soga, T. Tamura, H. Taki .....	737
Development of Manga-style Chat System Aiming to Communicate Nonverbal Expression J. Itou, Y. Motojin, J. Munemori .....	745
Development of Manufacturing Support System for SME under Disruption Risk N.B. Mulyono, Y. Ishida .....	753
Development of MMRS (Mind Map and Relief System), an Information Sharing System for Children's Safety H. Kanoh .....	762
Development of an Automatic Measurement System of Diameter of Pupil - As an Indicator of Comprehension among Web-based Learners Y. Adachi, K. Konishi, M. Ozaki, Y. Iwahori .....	772
Disease Generating Model for 3D Display of the Effect of Treatment on 3D Optical Coherence Tomography Images N.N.A. Huyen, A. Yamakawa, D. Kodama, S. Tsuruoka, H. Kawanaaka, H. Takase, Y. Uji, H. Matsubara, F. Okuyama .....	780
Doze Sleepy Driving Prevention System (Finger Massage, High Density Oxygen Spray, Grapefruit Fragrance) with that Involves Chewing Dried Shredded Squid T. Fruhata, T. Miyachi, T. Adachi, S. Iga, T. Davaa .....	790

Dual Exclusive Partition in Fuzzy CoDoK and SCAD-based Fuzzy Co-clustering C.-H. Oh, K. Honda .....	800
Dynamic Isolation of Network Devices Using OpenFlow for Keeping LAN Secure from Intra-LAN Attack Y. Juba, H.-H. Huang, K. Kawagoe .....	810
E-business Process Modeling Issues: From the Viewpoint of Inter-organizational Process Efficiency and Information Sharing K. Iizuka, Y. Iizuka, C. Suematsu .....	820
Eco Car Project for Japan Students as a Virtual PBL Class H. Kanematsu, T. Kobayashi, N. Ogawa, D.M. Barry, Y. Fukumura, H. Nagai .....	828
Efficient Maximum Range Search on Remote Spatial Databases Using $k$ -Nearest Neighbor Queries H. Sato, R. Narita .....	836
Encouragement of Group Decisions Beyond the Sum of the Individuals based on Possible Estimations T. Entani .....	846
Evaluation of the Change of Work Using Simple Electroencephalography K. Yoshida, H. Hirai, Y. Sakamoto, I. Miyaji .....	855
Exploration and Exploitation of Information Systems Usage and Individual Performance Y. Luo, H. Ling .....	863
Extended Interval-valued Confidence for Inference of Knowware System Using Hybrid Logic L. Ding, S.-L. Lo .....	873
Extraction of Daily Life Log Measured by Smart Phone Sensors Using Neural Computing J. Botzheim, D. Tang, B. Yusuf, T. Obo, N. Kubota, T. Yamaguchi .....	883
Extraction of Disease Area from Retinal Optical Coherence Tomography Images Using Three Dimensional Regional Statistics I. Nakahara, M.F.A. Kadir, S. Tsuruoka, H. Takase, H. Kawanaka, F. Okuyama, H. Matsubara .....	893
Feature Selection based on Information Theory in the Clock Drawing Test M. Bennasar, R. Setchi, A. Bayer, Y. Hicks .....	902
Feedback of Flying Disc Throw with Kinect and its Evaluation K. Yamaoka, M. Uehara, T. Shima, Y. Tamura .....	912
Forecasting Students' Future Academic Records Using Past Attendance Recording Data and Grade Data H. Itoh, Y. Itoh, K. Funahashi, D. Yamamoto, S. Saito, I. Takumi, H. Matsuo .....	921
Fuzzy Multiple Criteria Decision Making Approach to Assess the Project Quality Management in Project Y.-F. Chang, H. Ishii .....	928
Generating Alternative Modules for a Plant Alarm System based on First-out Alarm Alternative Signals T. Hamaguchi, B. Mondori, K. Takeda, N. Kimura, M. Noda .....	937
High-speed and High-accuracy Scene Flow Estimation Using Kinect K. Sato, H. Wu, Q. Chen .....	945
How to Develop Security Case by Combining Real Life Security Experiences (Evidence) with D-case V. Patu, S. Yamamoto .....	954
Human Activity Monitoring Using Fuzzified Neural Networks M. Nii, Y. Kakiuchi, K. Takahama, K. Maenaka, K. Higuchi, T. Yumoto .....	960
Image Reproduction based on Texture Image Extension with Traced Drawing for Heavy Damaged Mural Painting H. Kawanaka, S. Kosaka, Y. Iwahori, S. Sugiyama .....	968
Image-based Evaluation of Patient Specific Instrument Attachment in TKA S. Kobashi, A. Toda, N. Shibanuma, Y. Hata .....	976
Improved Affinity Propagation for Gesture Recognition Y. Kokawa, H. Wu, Q. Chen .....	983
Interactive Document Expansion for Answer Extraction of Question Answering System J. Fukumoto, N. Aburai, R. Yamanishi .....	991
Interactive Visualization for Monitoring Support of Multiple BBS Threads Y. Takama, M. Okumura .....	1001
Intergartion of Information based on the Similarity in AHP A. Notsu, H. Kawakami, Y. Tezuka, K. Honda .....	1011
Introduction of Majority Vote of Neighborhood Conditions for Sneak Form Reinforcement Learning Y. Tezuka, A. Notsu, K. Honda .....	1021
Iris-Eyelid Separability Filter for Irises Tracking Q. Chen, K. Mastumoto, H. Wu .....	1029
Knowledge Collaboration through Enterprise Information Services S. Yamamoto .....	1038
Knowledge Transfer Support for Server Administration Using Operations Histories A. Hazeyama, E. Umino, H. Yoshii .....	1047
Markov Chain Monte Carlo versus Importance Sampling in Bayesian Inference of the GARCH Model T. Takaishi .....	1056
Mathematical Ranking Method for Emergency Facility Location Problem with Block-wisely Different Accident Occurrence Probabilities H. Ishii, Y.L. Lee .....	1065

Method to Share Responsibility Knowledge of Dependability Cases T. Saruwatari, T. Hoshino, S. Yamamoto .....	1073
MICR Automated Recognition based on Paraconsistent Artificial Neural Networks S. Souza, J.M. Abe, K. Nakamatsu .....	1083
Modified Hybridized Multi-agent Oriented Approach to Analyze Work-stress Data Providing Feedback in Real Time A. Ghosh, J.W. Tweedale, A. Nafalski .....	1092
Motion Estimations based on Invariant Moments for Frames Interpolation in Stereovision M. Favorskaya, D. Pyankov, A. Popov .....	1102
Motor Skill Development Using Motion Recognition based on an HMM K. Yamada, K. Matsuura, K. Hamagami, H. Inui .....	1112
Nonlinear Identification Using Single Input Connected Fuzzy Inference Model H. Seki .....	1121
Omoiyari and Reference Place: Team Support based on Multi-modal Communication R. Oehlmann, H. Chaudhry .....	1126
On the Effectiveness of Candlestick Chart Analysis for the Brazilian Stock Market H.A. do Prado, E. Ferneda, L.C.R. Morais, A.J.B. Luiz, E. Matsura .....	1136
Optimal Layout of a Chemical Process Plant to Minimize the Risk to Humans K. Han, S. Cho, E.S. Yoon .....	1146
PageRank-based Traffic Simulation Using Taxi Probe Data N. Mukai .....	1156
PastePost: A Web Interface for Editing Instructions with Captured Images M. Miura, S. Yoshida .....	1164
Predicting the Security Levels of Stock Investment by Using the RMT-test X. Yang, Y. Mikamori, M. Tanaka-Yamawaki .....	1172
Proposal of a Web Learning Support System Using Teaching Materials based on Degree of Achievement and Note-taking Techniques H. Usami, A. Sugimura, Y. Adachi, M. Ozaki .....	1182
Radar Emitter Signals Recognition and Classification with Feedforward Networks N. Petrov, I. Jordanov, J. Roe .....	1192
Randomness Criteria of the RMT-test Compared to the NIST Y. Mikamori, X. Yang, R. Itoi, M. Tanaka-Yamawaki .....	1201
RANTORE: A Strategic Exertainment System Using Location Information J. Munemori, T. Korin, J. Itou, T. Yuizono .....	1210
Relationship Between Curation, Chance and Shikake A. Abe .....	1219
Rendering of Wind Effects in 3D Landscape Scenes M. Favorskaya, A. Tkacheva .....	1229
Scalable Adaptive Group Communication for Collaboration Framework of Cloud-enabled Robots R.M.A. Mateo .....	1239
Secure Audit Log Management O. Söderström, E. Moradian .....	1249
Self-destruction Dynamics of HIV-1 Quasi-species Population in the Presence of Mutagenic Activities K. Harada .....	1259
Semantic Representation and Integration of Digital Evidence S. Dosis, I. Homem, O. Popov .....	1266
Semantical-coordinate Terms Detection from Hierarchical Knowledge Using Web Snippets R. Yamanishi, J. Fukumoto, F. Masui .....	1276
Shape from Endoscope Image based on Photometric and Geometric Constraints K. Tatematsu, Y. Iwahori, T. Nakamura, S. Fukui, R.J. Woodham, K. Kasugai .....	1285
Simulation-based Planning of Shutdown Operations R. Bates .....	1294
The Extraction Method of the Service Improvement Information from Guests' Review K. Tsujii, Y. Fujita, K. Tsuda .....	1303
The Prediction of Ellipses Using Topic Model for Japanese Colloquial Inquiry Text T. Harada, Y. Fujita, K. Tsuda .....	1311
Toward Introduction of Immunity-based Model to Continuous Behavior-based User Authentication on Smart Phone Y. Watanabe, Houryu, T. Fujita .....	1319
Towards the Profitability Trend Extraction from the Board Meeting Proceedings M. Takahashi, K. Kido, K. Hashimoto .....	1328
Towards Trial Simulation of Homogeneous Behavior T. Nomakuchi, H. Kuroki, M. Takahashi .....	1336
Typical Functions of e-Textbook, Implementation, and Compatibility Verification with Use of ePub3 Materials T. Nakajima, S. Shinohara, Y. Tamura .....	1344

US Students Carry out Nuclear Safety Project in a Virtual Environment D.M. Barry, H. Kanematsu, Y. Fukumura, T. Kobayashi, N. Ogawa, H. Nagai . . . . .	1354
Using GIS to Simulate Inpatient's Behavior and Visualize Healthcare Demand S. Doi, T. Inoue, H. Ide, T. Nakamura, S. Fujita, K. Takabayashi . . . . .	1361
Using Multi-Agent Systems to Pursue Autonomy with Automated Components J.W. Tweedale . . . . .	1369
Visualization System for Analyzing Collaborative Learning Interaction Y. Hayashi, Y. Ogawa, Y.I. Nakano . . . . .	1379
Towards a Semi-automatic Semantic Approach for Satellite Image Analysis C. de Sciascio, C. Zanni-Merk, C. Wemmert, S. Marc-Zwecker, F. de Bertrand de Beuvron . . . . .	1388