Contents – Part II

WebSys: Special Session on Collective Intelligence in Web Systems - Web Systems Analysis

Optimization of 3D Rendering by Simplification of Complicated Scene for Mobile Clients of Web Systems ............................................................. 3
   Tomas Marek and Ondrej Krejcar

Automatic Categorization of Shots in News Videos Based on the Temporal Relations ................................................................. 13
   Kazimierz Choroś

Saliency-Guided Video Deinterlacing .......................................................... 24
   Maria Trocan and François-Xavier Coudoux

Towards a System for Cloud Service Discovery and Composition Based on Ontology ................................................................. 34
   Rawand Guerfel, Zohra Sbaï, and Rahma Ben Ayed

Modeling the Impact of Visual Components on Verbal Communication in Online Advertising ................................................................. 44
   Jarosław Jankowski, Jarosław Wątróbski, and Paweł Ziemba

Countering Social Engineering Through Social Media: An Enterprise Security Perspective ................................................................. 54
   Heidi Wilcox and Maumita Bhattacharya

Loading Speed of Modern Websites and Reliability of Online Speed Test Services ................................................................. 65
   Aneta Bartuskova and Ondrej Krejcar

Knowledge Management in Website Quality Evaluation Domain ................................................................. 75
   Paweł Ziemba, Jarosław Jankowski, Jarosław Wątróbski, and Jarosław Becker

CSI: Special Session on Computational Swarm Intelligence

A New Algorithm to Categorize E-mail Messages to Folders with Social Networks Analysis ................................................................. 89
   Urszula Borzycka, Barbara Probierz, and Jan Kozak
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population-Based Ant Colony Optimization for Sequential Ordering Problem</td>
<td>99</td>
</tr>
<tr>
<td>Rafał Skinderowicz</td>
<td></td>
</tr>
<tr>
<td>Designing a Universal Suboptimal Tree Integration Algorithm</td>
<td>110</td>
</tr>
<tr>
<td>Marcin Maleszka</td>
<td></td>
</tr>
<tr>
<td>Heterogeneous DPSO Algorithm for DTSP</td>
<td>119</td>
</tr>
<tr>
<td>Urszula Boryczka and Łukasz Stręk</td>
<td></td>
</tr>
<tr>
<td>Decomposition Based Multiobjective Hyper Heuristic with Differential Evolution</td>
<td>129</td>
</tr>
<tr>
<td>Richard A. Gonçalves, Josiel N. Kuk, Carolina P. Almeida, and Sandra M. Venske</td>
<td></td>
</tr>
<tr>
<td>Multi-start Differential Evolution Approach in the Process of Finding Equilibrium Points in the Covariant Games</td>
<td>139</td>
</tr>
<tr>
<td>Przemysław Juszczuk</td>
<td></td>
</tr>
<tr>
<td>Genetic Algorithm in Stream Cipher Cryptanalysis</td>
<td>149</td>
</tr>
<tr>
<td>Iwona Polak and Mariusz Boryczka</td>
<td></td>
</tr>
<tr>
<td>Cryptanalysis of SDES Using Modified Version of Binary Particle Swarm Optimization</td>
<td>159</td>
</tr>
<tr>
<td>Kamil Dworak and Urszula Boryczka</td>
<td></td>
</tr>
<tr>
<td>CSDMO: Special Session on Cooperative Strategies for Decision Making and Optimization</td>
<td></td>
</tr>
<tr>
<td>InterCriteria Analysis of Parameters Relations in Fermentation Processes Models</td>
<td>171</td>
</tr>
<tr>
<td>Olympia Roeva, Peter Vassilev, Maria Angelova, and Tania Pencheva</td>
<td></td>
</tr>
<tr>
<td>Optimization Procedure of the Multi-parameter Assessment and Bidding of Decision-Making Variants in the Computerized Decision Support System</td>
<td>182</td>
</tr>
<tr>
<td>Jarosław Becker and Ryszard Budziński</td>
<td></td>
</tr>
<tr>
<td>Supporting Cooperative Decisions with a Multicriteria Generalization of the Nash Solution</td>
<td>193</td>
</tr>
<tr>
<td>Lech Kruś</td>
<td></td>
</tr>
<tr>
<td>Performance Evaluation of Multi-UAV Cooperative Mission Planning Models</td>
<td>203</td>
</tr>
<tr>
<td>Cristian Ramirez-Atencia, Gema Bello-Organz, Maria D. R-Moreno, and David Camacho</td>
<td></td>
</tr>
</tbody>
</table>
A Hybrid Distance-Based and Naive Bayes Online Classifier ........................ 213  
Joanna Jędrzejowicz and Piotr Jędrzejowicz

Cluster-Dependent Feature Selection for the RBF Networks ......................... 223  
Ireneusz Czarnowski and Piotr Jędrzejowicz

ANST: Special Session on Advanced Networking and Security Technologies

SAME: An Intelligent Anti-malware Extension for Android ART Virtual Machine ..................................................... 235  
Konstantinos Demertzis and Lazaros Iliadis

Endpoint Firewall for Local Security Hardening in Academic Research Environment .......................................................... 246  
Ladislav Balík, Josef Horálek, Ondrej Hornig, Vladimir Sobeslav, Rafael Doležal, and Kamil Kuca

Fuzzy Granular Classifier Approach for Spam Detection .......................... 256  
Saber Salehi, Ali Selamat, Ondrej Krejcar, and Kamil Kuca

A Recent Study on the Rough Set Theory in Multi-criteria Decision Analysis Problems .......................................................... 265  
Masurah Mohamad, Ali Selamat, Ondrej Krejcar, and Kamil Kuca

Network Visualization Survey ................................................................. 275  
Ales Komarek, Jakub Pavlík, and Vladimir Sobeslav

A Proposal of a Big Web Data Application and Archive for the Distributed Data Processing with Apache Hadoop ..................................................... 285  
Martin Lnenicka, Jan Hovad, and Jitka Komarková

Centralized Data Flow Management System ............................................. 295  
Agáta Bodnárová and Michal Kókörčený

Decision Support Smartphone Application Based on Interval AHP Method.... 306  
Richard Cimler, Karel MLs, and Martin Gavalec

Impact of Weather Conditions on Fingerprinting Localization Based on IEEE 802.11a ................................................................. 316  
Peter Brida and Juraj Machaj

Enterprise ICT Transformation to Agile Environment ............................... 326  
Ales Komarek, Vladimir Sobeslav, and Jakub Pavlík

Analysis of the Use of Cloud Services and Their Effects on the Efficient Functioning of a Company ..................................................... 336  
Josef Horálek, Simeon Karamazov, Filip Holik, and Tomas Svoboda
Proposal to Centralize Operational Data Outputs of Airport Facilities........... 346
    Josef Horalek, Sona Neradova, Simeon Karamazov, Filip Holik, Ondrej Marik, and Stanislav Zitta

IED Remote Data Acquisition and Processing in Power Distribution ............ 355
    Ladislav Balik, Ondrej Hornig, Josef Horalek, and Vladimir Sobeslav

Social Networks and Their Potential for Education ......................... 365
    Petra Poulova and Blanka Klimova

ITiB: Special Session on IT in Biomedicine

Development of Information and Management System for Laboratory Based on Open Source Licensed Software .............................. 377
    Pavel Blazek, Kamil Kuca, Daniel Jun, and Ondrej Krejcar

Determining of Blood Artefacts in Endoscopic Images Using a Software Analysis .................................................. 388
    Lukas Sulik, Ondrej Krejcar, Ali Selamat, Reza Mashinchi, and Kamil Kuca

Combating Infectious Diseases with Computational Immunology .............. 398
    Martina Husáková

Mobile Cloud Computing in Healthcare System ................................ 408
    Hanen Jemal, Zied Kechaou, Mounir Ben Ayed, and Adel M. Alimi

Parallel Flexible Molecular Docking in Computational Chemistry on High Performance Computing Clusters .............................. 418
    Rafael Dolezal, Teodorico C. Ramalho, Tanos C.C. França, and Kamil Kuca

ColEdu: Special Session on Collective Computational Intelligence in Educational Context

Meta-Learning Based Framework for Helping Non-expert Miners to Choice a Suitable Classification Algorithm: An Application for the Educational Field ........................................ 431
    Marta Zorrilla and Diego Garcia-Saiz

Fuzzy Logic Based Modeling for Building Contextual Student Group Recommendations .................................. 441
    Krzysztof Myszkorowski and Danuta Zakrzewska

Mining Social Behavior in the Classroom ...................................... 451
    Roberto Araya, Ragnar Behncke, Amitai Linker, and Johan van der Molen
Using Concept Maps in Education of Immunological Computation and Computational Immunology ................................. 461
Martina Husáková

Framework of Design Requirements for E-learning Applied on Blackboard Learning System .................................................. 471
Aneta Bartuskova, Ondrej Krejcar, and Ivan Soukal

SIDATA: Special Session on Science Intelligence and Data Analytics

Expressing a Temporal Entity-Relationship Model as a Traditional Entity-Relationship Model .................................................. 483
Hoang Quang and Thuong Pham

A Probabilistic Ontology for the Prediction of Author’s Interests .......... 492
Emna Hlel, Salma Jamoussi, and Abdelmajid Ben Hamadou

A Framework of Faceted Search for Unstructured Documents Using Wiki Disambiguation ...................................................... 502
Duc Binh Dang, Hong Son Nguyen, Thanh Binh Nguyen, and Trong Hai Duong

Current Derivative Estimation of Non-stationary Processes Based on Metrical Information .................................................. 512
Elena Kochegurova and Ekaterina Gorokhova

An Intelligent Possibilistic Approach to Reduce the Effect of the Imperfection Propagation on Land Cover Change Prediction. ....... 520
Ahlem Ferchichi, Wadii Boulila, and Imed Riadh Farah

CIFM: Special Session on Computational Intelligence in Financial Markets

Measuring the Impact of Imputation in Financial Fraud ..................... 533
Stephen O. Moepya, Sharat S. Akhoury, Fulufhelo V. Nelwamondo, and Bhekisipho Twala

An Improved Grey Forecasting Models: Case in China’s Coal Consumption Demand ......................................................... 544
Chia-Nan Wang and Van-Thanh Phan

EL: Special Session on Ensemble Learning

Investigation of the Impact of Missing Value Imputation Methods on the k-NN Classification Accuracy ................................. 557
Tomasz Orczyk and Piotr Porwik
Enhancing Intelligent Property Valuation Models by Merging Similar Cadastral Regions of a Municipality

Tadeusz Lasota, Edward Sawilow, Zbigniew Telec, Bogdan Trawiński, Marta Roman, Paulina Matczuk, and Patryk Popowicz

Blurred Labeling Segmentation Algorithm for Hyperspectral Images

Paweł Ksieniewicz, Manuel Graña, and Michał Woźniak

Keystroke Data Classification for Computer User Profiling and Verification

Tomasz Emanuel Wesołowski and Piotr Porwik

The New Multilayer Ensemble Classifier for Verifying Users Based on Keystroke Dynamics

Rafal Doroz, Piotr Porwik, and Hossein Safaverdi

Application of Evolving Fuzzy Systems to Construct Real Estate Prediction Models

Martin Grzesłowski, Zbigniew Telec, Bogdan Trawiński, Tadeusz Lasota, and Krzysztof Trawiński

BigDMS: Special Session on Big Data Mining and Searching

What If Mixing Technologies for Big Data Mining and Queries Optimization

Dhouha Jemal and Rim Faiz

Parallel K-prototypes for Clustering Big Data

Mohamed Aymen Ben HajKacem, Chiheb-Eddine Ben N’cir, and Nadia Essoussi

Big Data: Concepts, Challenges and Applications

Imen Chebbi, Wadii Boulila, and Imed Riadh Farah

Improving Information-Carrying Data Capacity in Text Mining

Marcin Gibert

Author Index
## Contents – Part I

Text Classification Using Novel “Anti-Bayesian” Techniques .......................... 1  
*B. John Oommen, Richard Khoury, and Aron Schmidt*

### Multi-agent Systems

ADELFE 3.0 Design, Building Adaptive Multi Agent Systems  
Based on Simulation a Case Study ............................................................... 19  
*Wafa Mefteh, Frederic Migeon, Marie-Pierre Gleizes, and Faiez Gargouri*

Multi Agent Model Based on Chemical Reaction Optimization for Flexible  
Job Shop Problem ................................................................. 29  
*Bilel Marzouki and Belkahla Driss Olfa*

MATS–JSTL: A Multi-Agent Model Based on Tabu Search for Job Shop  
Problem with Time Lags ................................................................. 39  
*Madiha Harrabi and Olfa Belkahla Driss*

A Model of a Multiagent Early Warning System for Crisis Situations  
in Economy ................................................................. 47  
*Marcin Hernes, Marcin Maleszka, Ngoc Thanh Nguyen, and Andrzej Bymiewski*

Combining Machine Learning and Multi-Agent Approach for Controlling  
Traffic at Intersections ................................................................. 57  
*Mateusz Krzysztoń and Bartłomiej Śnieżyński*

A Scalable Distributed Architecture for Web-Based Software Agents .......... 67  
*Dejan Mitrović, Mirjana Ivanović, Milan Vidaković, and Zoran Budimac*

Mapping BPMN Processes to Organization Centered Multi-Agent Systems  
to Help Assess Crisis Models ............................................................. 77  
*Nguyen Tuan Thanh Le, Chihab Hanachi, Serge Stinckwich, and Tuong Vinh Ho*

Agent Based Quality Management in Lean Manufacturing ........................ 89  
*Rafal Cupek, Huseyin Erdogan, Lukasz Huczala, Udo Wozar, and Adam Ziebinski*

Towards a Framework for Hierarchical Multi-agent Plans Diagnosis  
and Recovery ................................................................. 101  
*Said Brahimi, Ramdane Maamri, and Sahnoun Zaidi*
Social Networks and NLP

A Survey of Twitter Rumor Spreading Simulations .......................... 113
   Emilio Serrano, Carlos A. Iglesias, and Mercedes Garijo

Mining Interesting Topics in Twitter Communities .......................... 123
   Eleni Vathi, Georgios Siolas, and Andreas Stafylopatis

Community Division of Bipartite Network Based on Information
Transfer Probability ................................................................. 133
   Chunlong Fan, Hengchao Wu, and Chi Zhang

User-Tweet Interaction Model and Social Users Interactions
for Tweet Contextualization ..................................................... 144
   Rami Belkaroui, Rim Faiz, and Pascale Kuntz

Supervised Learning to Measure the Semantic Similarity Between
Arabic Sentences ................................................................. 158
   Wafa Wali, Bilel Gargouri, and Abdelmajid Ben hamadou

Sentiment Analysis

How Impressionable Are You? - Grey Knowledge, Groups and Strategies
in OSN ................................................................................. 171
   Camelia Delcea, Ioana Bradea, Ramona Paun, and Emil Scarlat

Semi-supervised Multi-view Sentiment Analysis .............................. 181
   Gergana Lazarova and Ivan Koychev

Modelling and Simulating Collaborative Scenarios for Designing
an Assistant Ambient System that Supports Daily Activities ............. 191
   Sameh Triki, Chihab Hanachi, Marie-Pierre Gleizes, Pierre Glize,
   and Alice Rouyer

Regression Methods in the Authority Identification Within Web
Discussions .............................................................................. 203
   Kristína Machová and Jaroslav Štefaník

Sem-SPARQL Editor: An Editor for the Semantic Interrogation
of Web Pages ........................................................................... 213
   Sahar Maâlej Dammak, Anis Jedidi, and Rafik Bouaziz

Computational Intelligence and Games

Enhancing History-Based Move Ordering in Game Playing Using Adaptive
Data Structures ......................................................................... 225
   Spencer Polk and B. John Oommen
Text-Based Semantic Video Annotation for Interactive Cooking Videos

Kyeong-Jin Oh, Myung-Duk Hong, Ui-Nyoung Yoon, and Geun-Sik Jo

236

Objects Detection and Tracking on the Level Crossing

Zdeněk Silar and Martin Dobrovolný

245

Spatial-Based Joint Component Analysis Using Hybrid Boosting Machine for Detecting Human Carrying Baggage

Wahyono and Kang-Hyun Jo

256

Multi-population Cooperative Bat Algorithm for Association Rule Mining

Kamel Eddine Heraguemi, Nadjet Kamel, and Habiba Drias

265

Supervised Greedy Layer-Wise Training for Deep Convolutional Networks with Small Datasets

Diego Rueda-Plata, Raúl Ramos-Pollán, and Fabio A. González

275

An Equilibrium in a Sequence of Decisions with Veto of First Degree

David Ramsey and Jacek Mercik

285

DC Programming and DCA for Dictionary Learning

Xuan Thanh Vo, Hoai An Le Thi, Tao Pham Dinh, and Thi Bich Thuy Nguyen

295

Evolutionary Algorithm for Large Margin Nearest Neighbour Regression

Florin Leon and Silvia Curteanu

305

Artificial Immune System: An Effective Way to Reduce Model Overfitting

Waseem Ahmad and Ajit Narayanan

316

Malfunction Immune Wi–Fi Localisation Method

Rafał Górkak and Marcin Luckner

328

User Profile Analysis for UAV Operators in a Simulation Environment

Víctor Rodríguez-Fernández, Héctor D. Menéndez, and David Camacho

338

Ontologies and Information Extraction

Ontology-Based Information Extraction from Spanish Forum

Willy Peña and Andrés Melgar

351

Knowledge-Based Approach to Question Answering System Selection

Agnieszka Konys

361

Text Relevance Analysis Method over Large-Scale High-Dimensional Text Data Processing

Ling Wang, Wei Ding, Tie Hua Zhou, and Keun Ho Ryu

371

Contents – Part I

XXI
Linguistic Summaries of Graph Datasets Using Ontologies: An Application to Semantic Web. ............................................ 380
Lukasz Strobin and Adam Niewiadomski

Movie Summarization Using Characters Network Analysis. ..................... 390
Quang Dieu Tran, Dosam Hwang, and Jason J. Jung

A Mobile Context-Aware Proactive Recommendation Approach ............ 400
Imen Akermi and Rim Faiz

A Method for Profile Clustering Using Ontology Alignment in Personalized Document Retrieval Systems ......................... 410
Bernadetta Maleszka

User Personalisation for the Web Information Retrieval Using Lexico-Semantic Relations ............................................ 421
Agnieszka Indyka-Piasecka, Piotr Jacewicz, and Elżbieta Kukla

Formal Models and Simulation

Formal and Computational Model for A. Smith’s Invisible Hand Paradigm... 433
Tadeusz (Tad) Szuba, Stanislaw Szydlo, and Pawel Skrzynski

Comparison of Edge Operators for Detection of Vanishing Points ........... 443
Dongwook Seo, Danilo Cáceres Hernández, and Kang-Hyun Jo

A Tolerance-Based Semantics of Temporal Relations: First Steps .......... 453
Aymen Gammoudi, Allel Hadjali, and Boutheina Ben Yaghlane

Integer Programming Based Stable and Efficiency Algorithm for Two-sided Matching with Indifferences ............................................ 463
Naoki Ohta

Neural Networks, SMT and MIS

Design Analysis of Intelligent Dynamically Phased Array Smart Antenna Using Dipole Leg and Radial Basis Function Neural Network .............. 475
Abhishek Rawat, Vidhi Rawat, and R.N. Yadav

On the Accuracy of Copula-Based Bayesian Classifiers: An Experimental Comparison with Neural Networks ................................. 485
Lukáš Slechan and Jan Górecki

Automating Event Recognition for SMT Systems ................................ 494
Emna Hkiri, Souheyl Mallat, Mohsen Maraoui, and Mounir Zrigui

Deriving Consensus for Term Frequency Matrix in a Cognitive Integrated Management Information System ................................. 503
Marcin Hernes

Author Index ................................................................. 513