

Proceedings

6th International Conference on
COMPUTER INFORMATION SYSTEMS AND
INDUSTRIAL MANAGEMENT APPLICATIONS

CISIM 2007

Elk, Poland

28–30 June 2007



Los Alamitos, California
Washington • Tokyo



Table of Contents

Foreword	x
CISIM 2007 Steering Committee Chair’s Message	xii
CISIM 2007 Organization	xiii
Plenary Abstracts	xv

Keynote Papers

Should Normal Distribution be Normal? The Student’s T Alternative	3
<i>Anna Bartkowiak</i>	
A New Approach for Computer Support of Strategic Decision Making in Enterprises by Means of a New Class of Understanding Based Management Support Systems	9
<i>Ryszard Tadeusiewicz, Marek Ogiela, and Lidia Ogiela</i>	
GUI Patterns and Web Semantics	14
<i>Václav Snášel</i>	
Finding a Needle in a Haystack—From Baldwin Effect to Quantum Computation	20
<i>Akira Imada</i>	
Iris Image Recognition	26
<i>Ryszard S. Choras</i>	
Toward Higher Level Intelligent Systems	31
<i>Kurosh Madani</i>	
Introduction of Humatronics — Towards Integration of Web Intelligence and Robotics	37
<i>Yasufumi Takama</i>	
Benchmark Problems of Signal Processing and Control for Testing Emergent Architectures and Programming Techniques of DSP’s, FASIC’s, and PLD’s	45
<i>Adam Dąbrowski and Paweł Pawłowski</i>	

Intelligent Computing and Frameworks

Location Prediction Methods with Markovian Approach and Extended Random Walk Model	53
<i>Péter Fülöp, Sándor Szabó, and Tamás Szálka</i>	
Architecture of a Predictive Maintenance Framework	59
<i>Christin Groba, Sebastian Cech, Frank Rosenthal, and Andreas Gössling</i>	
The Theoretical Framework of the Optimization of Public Transport Travel	65
<i>Jolanta Koszelew</i>	
Estimation of the Average Time of Computations of Probabilistic Algorithms with Continuous Time Parameter	71
<i>Joanna Karbowska-Chilińska</i>	
UBMSS (Understanding Based Managing Support Systems) as an Example of the Application of Cognitive Analysis in Data Analysis	77
<i>Lidia Ogiela</i>	
Interpretation of Probabilistic Algorithmic Logic in Nondeterministic Algorithmic Logic	81
<i>Agnieszka Makarec</i>	
On Töeplitz Matrices Minimal Eigenvalues in Moving Object Description	87
<i>Khalid Saeed and Krzysztof Piekarski</i>	
Some Criteria of Making Decisions in Pedestrian Evacuation Algorithms	93
<i>Bartłomiej Gudowski and Jarosław Wąs</i>	
Universally Composable Key-evolving Signature	97
<i>Jin Zhou, YueFei Zhu, TingMao Chang, and YaJuan Zhang</i>	
Histogram-based Dimensionality Reduction of Term Vector Space	103
<i>Krzysztof Ciesielski, Mieczysław A. Kłopotek, and Sławomir T. Wierchoń</i>	
Bearing's Behavior Modeling for Mechanical Defects' Detection and Diagnosis	109
<i>Moustapha Sène, Michel Barret, and Kurosh Madani</i>	
Hybrid Intelligent Diagnosis Systems	115
<i>Amine Chohra, Nadia Kanaoui, and Kurosh Madani</i>	
Finite Difference Runoff Modelling Using "Voronoi Buckets"	121
<i>Maciej Dakowicz and Christopher Gold</i>	
Atomic Operators for Construction and Manipulation of the Augmented Quad-Edge	125
<i>Paweł Bogusławski and Christopher Gold</i>	
Application of the Kinetic Voronoi Diagram to the Real-Time Navigation of Marine Vessels	129
<i>Rafał Goralski, Christopher Gold, and Maciej Dakowicz</i>	
A Grouping Aggregation Algorithm Based on the Dimension Hierarchical Encoding in Data Warehouse	135
<i>Zhen-zhi Gong, Kong-fa Hu, and Qing-Li Da</i>	

Nature Inspired Computing and Problem Solving

B-Cell Algorithm as a Parallel Approach to Optimization of Moving Peaks Benchmark Tasks	143
<i>Krzysztof Trojanowski</i>	
Ants and Multiple Knapsack Problem	149
<i>Urszula Boryczka</i>	

Simple Method of Increasing the Coverage of Nonself Region for Negative Selection Algorithms	155
<i>Andrzej Chmielewski and Sławomir T. Wierzchoń</i>	
AIS for Trend Change Detection	161
<i>Andrzej Domaradzki</i>	
A Particle Swarm Algorithm for Neighbor Selection in Peer-to-Peer Networks	166
<i>Shichang Sun, Ajith Abraham, Guiyong Zhang, and Hongbo Liu</i>	

Digital Communication and Information Management

Wireless Sensor Network for Intravenous Dripping Systems	173
<i>U. Bilbao, P. Bustamante, N. Guarretxena, and J. Santo Domingo</i>	
IDSX: A Cluster Based Collaborative Intrusion Detection Algorithm for Mobile Ad-Hoc Network	179
<i>Rituparna Chaki and Nabendu Chaki</i>	
ORRP: Optimal Reactive Routing Protocol for Mobile Ad-Hoc Networks	185
<i>Nabendu Chaki and Rituparna Chaki</i>	
Enhanced Mobility Management Modelling Framework	191
<i>Péter Fülöp and Benedek Kovács</i>	
Spread Spectrum Signals Classification Based on the Wigner-Ville Distribution and Neural Network Probability Density Function Estimation.....	197
<i>Yuri Grishin</i>	
An Adaptive Data Broadcasting Model in Mobile Information Systems.....	203
<i>John Tsiligaridis and Raj Acharya</i>	
Towards a Pervasive Mobile Multimedia Experience	209
<i>Xu Chen, M.J. O'Grady, and G.M.P. O'Hare</i>	
Mobile Agent-Based Digital Rights Management Scheme	213
<i>Bartłomiej Ziółkowski and Janusz Stokłosa</i>	
On Frequency Synchronization of e-Learning Web System Users	219
<i>Romuald Mosdorf and Bożena Ignatowska</i>	
Deniable File System — Application of Deniable Storage to Protection of Private Keys	225
<i>Bartosz Oler and Imed El Fray</i>	
VCOP — The System of Visual Communication with Computers for Paralyzed Users	230
<i>Grzegorz Kurdziel and Halina Kwasnicka</i>	

Image Processing, Recognition, and Biometrics

Face Recognition Using Kernel PCA and Hierarchical RBF Network	239
<i>Jin Zhou, Yang Liu, and Yuehui Chen</i>	
ICA Based on KPCA and Hybrid Flexible Neural Tree to Face Recognition.....	245
<i>Jin Zhou, Yang Liu, and Yuehui Chen</i>	
Fuzzy Data in Local Optimal Strategy of Multistage Recognition.....	251
<i>Robert Burduk</i>	

Semi-Automatic Segmentation of Fibrous Liver Tissue	255
<i>P. Andruszkiewicz, C. Bołdak, and J. Jaroszewicz</i>	
Image Feature Extraction Methods for Ear Biometrics — A Survey	261
<i>Michał Choraś</i>	
Capillaroscopy Image Analysis as an Automatic Image Annotation Problem	266
<i>Halina Kwasnicka, Mariusz Paradowski, and Krzysztof Borysewicz</i>	
Image Analysis by Methods of Dimension Reduction.....	272
<i>Pavel Moravec, Václav Snášel, Alexander Frolov, Dušan Hůsek, Hana Řezanková, and Pavel Polyakov</i>	
Images Reconstruction with Use of a Genetic Algorithm.....	278
<i>Anna Piwońska and Urszula Grycuk</i>	
The Compact Three Stages Method of the Signature Recognition	282
<i>Piotr Porwik</i>	
Modified Word Recognition System — New Performance	288
<i>Marek Tabezdski and Khalid Saeed</i>	
Bandelet Union Optimal Matrix Norms Constructing Lossless Watermarking.....	294
<i>Yue-Xiang Yang, Li-Zhi Cheng, Yong Luo, and Rui Wang</i>	
Standard and Genetic <i>k</i> -means Clustering Techniques in Image Segmentation.....	299
<i>Dariusz Małyszko and Sławomir T. Wierzchoń</i>	
Using Wavelet Transform, DPCM and Adaptive Run-length Coding to Compress Images	305
<i>Ban N. Thanoon</i>	
Nonlinear and Frequency Analysis of the Weather in Białystok	310
<i>Jarosław Kilon, Aida Saeed-Baginska, Jerzy Sienkiewicz, and Romuald Mosdorf</i>	
Semi-Supervised Handwritten Word Segmentation Using Character Samples Similarity Maximization and Evolutionary Algorithm	316
<i>Jerzy Sas and Urszula Markowska-Kaczmar</i>	
Mathematical Morphology Based ECG Feature Extraction for the Purpose of Heartbeat Classification	322
<i>Paweł Tadejko and Waldemar Rakowski</i>	
Using Shaded Views in 3D Multiview Representation of Monotonous Polyhedron.....	328
<i>W.S. Mokrzycki and A. Salamończyk</i>	

Computer System Engineering

Obfuscation as Intellectual Rights Protection in VHDL Language.....	337
<i>Maciej Brzozowski and Vyacheslav N. Yarmolik</i>	
Address Sequences Generation for Multiple Run Memory Testing.....	341
<i>S.V. Yarmolik, I. Mrozek, and B. Sokol</i>	
FSM State Assignment Methods for Low-Power Design.....	345
<i>Valery Salauyou and Tomasz Grześ</i>	

Industrial Management

Managing Information on Industrial Automation Projects	351
<i>Jan Jekielek</i>	
Organizational Knowledge Measurement.....	357
<i>Joanna Moczyłowska</i>	
Support of Decision Making by Business Intelligence Tools	364
<i>Milena Tvrđiková</i>	
A Study on the Importance of Biometric Technique Selection in the Protection of Company Resources.....	369
<i>Anna Zajkowska, Wojciech Zimnoch, and Khalid Saeed</i>	
Cooperation of Enterprises in the Area of Innovative Activity.....	375
<i>Anna Strychalska-Rudzewicz</i>	
Adapting Price Negotiations to an E-commerce System Scenario.....	380
<i>Marcin Paprzycki and Maria Ganzha</i>	
Author Index	387