The 21st International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems (IEA-AIE 2008) held in Wroclaw, Poland was an international scientific forum for researchers in the field of applied artificial intelligence. The presentations of the invited speakers and the authors focused on developing and employing methods and systems to solve real-life problems in all applied intelligence areas. The IEA-AIE conference series, chaired by Moonis Ali, has a very long tradition, and it is the first time it was hosted in Poland.

We received 302 papers from 52 countries. Each paper was sent to at least three Program Committee members for review. Although the general quality of the submissions was very high, only 90 best papers were selected for oral presentation and publication in the LNAI proceedings. The papers in the proceedings cover the following topics: computer vision, fuzzy system applications, robot, manufacturing, data mining and knowledge discovery, neural network, machine learning, natural language processing, Internet application, e-learning, heuristic search, application systems, agent-based system, evolutionary and genetic algorithms, knowledge management, and other applications.

These papers highlight new trends and frontiers of applied artificial intelligence and show how new research could lead to new and innovative applications. We hope you will find these works useful and inspiring for your own research.

We would like to express our sincere thanks to the Program Committee members and all the reviewers for their hard work, which helped us to select the highest quality papers for the conference.

The conference was organized by the Institute of Information Science and Engineering, Wroclaw University of Technology, in cooperation with the International Society of Applied Intelligence (ISAI). We would like to thank our main sponsors, ISAI and Wroclaw University of Technology. Our special thanks are due also to the other sponsors: American Association for Artificial Intelligence (AAAI); Association for Computing Machinery (ACM/SIGART); Canadian Society for the Computational Studies of Intelligence (CSCSI/SCEIO); European Neural Network Society (ENNS); International Neural Network Society (INNS); Japanese Society for Artificial Intelligence (JSAI); Taiwanese Association for Artificial Intelligence (TAAI); and Texas State University-San Marcos.

We wish to thank the members of the Program and Organizing Committees for their very substantial work, especially those who played essential roles: Radosław Katarzyniak (Organizing Chair), Ryszard Kowalczyk (Special Session Chair) and the organizers of the special sessions: Zbigniew Banaszak, Oleg Zaikin, Gordan Jezic, Dan Popescu, Costin Badica, Adrian Giurca, Heloisa de Arruda Camargo, Maria do Carmo Nicoletti, Estevam Rafael Hruschka Jr. and Abdelhamid Bouchachia.

Our special thanks go to the Foundation for Development of Wroclaw University of Technology for the efficient dealing with the registration and management issues.

We would like to thank the invited speakers for their interesting and informative talks of world-class standard. We cordially thank the authors for their valuable
contributions as well as the other participants of this conference. The conference would not have been possible without their support.

Thanks are also due to the many experts who contributed to making the event a success.

March 2008

Ngoc Thanh Nguyen
Leszek Borzemski
Adam Grzech
Moonis Ali
Conference Organization

General Chair
Moonis Ali
Texas State University, San Marcos, USA

Program Chairs
Leszek Borzemski
Wroclaw University of Technology, Poland
Adam Grzech
Wroclaw University of Technology, Poland
Ngoc Thanh Nguyen
Wroclaw University of Technology, Poland

Local Organizing Chair
Radoslaw Katarzyniak
Wroclaw University of Technology, Poland

Special Session Chair
Ryszard Kowalczyk
Swinburne University of Technology, Australia

Local Organizing Committee
Gomes Eduardo  Adrianna Kozierkiewicz
Mariusz Fraś  Wojciech Lorkiewicz
Krzysztof Juszczyszyn  Grzegorz Popek
Anna Kozłowska
Special Sessions

1 Knowledge-Driven Manufacturing Systems
   Zbigniew A. Banaszak and Oleg Zaikin

2 Joint Session on Adaptive Networked Systems and Fuzzy Knowledge Bases
   Costin Badica, Heloisa de Arruda Camargo et al.

3 Software Agents and Multi-agent Systems
   Gordan Jezic

Invited Speakers

Shyi-Ming Chen
National Taiwan University of Science and Technology, Taiwan

Lakhmi C. Jain,
University of South Australia, Australia

Janusz Kacprzyk
Polish Academy of Science, Poland

Ryszard Kowalczyzk
Swinburne University of Technology, Australia

Edward Szczepicki
Gdańsk University of Technology, Poland

Ning Zhong
Maebashi Institute of Technology, Japan

Krzysztof Zieliński
AGH-University of Science and Technology, Poland

International Program Committee

Araz, Ceyhun, Turkey
Arredondo, Tomas, Chile
Banaszak, Zbigniew, Poland
Bannister, Peter R., UK
Belli, Fevzi, Germany
Brezillon, Patrick, France
Burke, Edmund, UK
Chan, C.W., Hong Kong - China
Chang, Chir-Ho, Taiwan
Chang, Chuan-Yu, Taiwan
Chau, Kwokwing, Hong Kong - China
Chen, Shyi-Ming, Taiwan

Lee, Chang-Shing, Taiwan
Lee, Huey-Ming, Taiwan
Lee, Tsang-Yean, Taiwan
Li, Yanzhi, China
Liu, Fuyan, China
Loganantharaj, Raja, USA
Madani, Kurosh, France
Mejia-Lavalle, Manuel, Mexico
Mitra, Debasis, USA
Monostori, Laszlo, Hungary
Murphey, Yi Lu, USA
Neumann, Bernd, Germany
Cheng, Ching-Hsue, Taiwan
Chiang, Yu-min, Taiwan
Chien,Been-Chian, Taiwan
Chung, Paul W.H., UK
Clifton, David A., UK
Desimone, Roberto V., UK
Dreyfus, Gerard, France
Esposito, Floriana, Italy
Garrido, Antonio, Spain
Guesgen, Hans Werner, New Zealand
Hendtlass, Tim, Australia
Hesuan, Hu, China
Hong, Tzung-Pei, Taiwan
Honghai, Feng, Taiwan
Huang, Yi-Sheng, Taiwan
Huget, Phillipe M., France
Ito, Takayuki, Japan
Iwata, Shuichi, Japan
Jacquenet, Francois, France
Jiang, Dongxiang, China
Jo, Kang-Hyun, Korea
Jo, Guen Sik, Korea
Jozefczyk, Jerzy, Poland
Kaikhah, Khosrow, USA
Kinoshita, Tetsuo, Japan
Korbicz, Jozef, Poland
Kumar, Amruth N., USA
Kwasnicka, Halina, Poland
Nishida, Toyoaki, Japan
Nocera, Pascal, France
Okuno, Hiroshi G., Japan
Potter, Don, USA
Ramaswamy, Srin, USA
Randall, Marcus, Australia
Rau, Hsin, Taiwan
Rayward-Smith, Victor J., UK
Sanchez-Marra, Miquel, Spain
Sakurai, Shigeaki, Japan
Selim, Hasan, Turkey
Soares Correa da Silva, Flavio, Brazil
Sun, Jun, China
Suzuki, Kazuhiko, Japan
Swiatek, Jerzy, Poland
Tang, Ke, China
Treur, Jan, Netherlands
Vadera, Sunil, UK
Valtorta, Marco, USA
Vancza, Jozsef, Hungary
Viharos, Zsolt Janos, Hungary
Wang, Leuo-Hong, Taiwan
Williams, Graham J., Australia
Xu, Wenbo, China
Yang, Chunsheng, Canada
Yang, Don-Lin, Taiwan
Yubin, Yang, China

Program Committees of Special Sessions

Akerkar, Rajendra, India
Badic, Costin, Romania
Balic, Joze, Slovenia
Burdescu, Dumitru, Romania
Cojocaru, Dorian, Romania
Corchado, Juan, Spain
Dolgui, Alexandre, France
Dostal, Petr, Czech Republic
Ebecken, Nelson, Brazil
Ganzha, Maria, Poland
Gasevic, Dragan, Canada
Giurca, Adrian, Germany
Gomide, Fernando, Brazil
Hruschka, Eduardo, Brazil
Huljenic, Darko, Croatia
Kapus, Tatjana, Slovenia
Nawarecki, Edward, Poland
Nemeth, Gabor, Hungary
Paprzycki, Marcin, Poland
Popescu, Dan, Romania
Ramer, Arthur, Australia
Rasvan, Vladimir, Romania
Simoff, Simeon J, Australia
Sobek, Janusz, Poland
Souza, Joao, Portugal
Stranjak, Armin, UK
Trigano, Philippe, France
Trzec, Krunoslav, Croatia
Vasilakos, Athanasios, Macedonia
Vellasco, Marley, Brazil
Virginias, Botond, UK
Vlaovic, Bostjan, Slovenia
Organization

Koppen, Mario, Japan
Krol, Dariusz, Poland
Kusek, Mario, Croatia
Menezes, Ronaldo, USA
Mohammadian, Masoud, Australia
Nalepa, Grzegorz J., Poland

Wagner, Ambrus, Hungary
Wagner, Gerd, Germany
Weber, Richard, Chile
Zagar, Mario, Croatia
Zaikin, Oleg, Poland
Zaremba, Marek, Canada

Additional Reviewers

Bocewicz, Grzegorz
Borzemski, Leszek
Fras, Dr. Mariusz
Jung, J. Jason
Juszczyszyn, Krzysztof
Kaplon, Tomasz
Katarzyniak, Radoslaw
Kiewra, Maciej
Kolaczk, Grzegorz
Makowska-Kaczmar, Urszula
Myszkowski, Pawel
Nowak, Ziemowit
Orolowski, Cezary
Prusiewicz, Agnieszka
Tabakow, Iwan
Zgrzywa, Aleksander
# Table of Contents

## Computer Vision

- Driver Assistance System Based on Monocular Vision .............................. 1  
  *Yu-Min Chiang, No-Zen Hsu, and Kuan-Liang Lin*

- Particle Swarm Optimization for Object Recognition in Computer Vision .......................................................... 11  
  *Hugo A. Perlin, Heitor S. Lopes, and Tânia Mezzadri Centeno*

- Building Surface Refinement Using Cluster of Repeated Local Features by Cross Ratio .......................................................... 22  
  *Hoang-Hon Trinh, Dae-Nyeon Kim, and Kang-Hyun Jo*

- Local Subspace-Based Denoising for Shot Boundary Detection ............ 32  
  *Xuefeng Pan, Yongdong Zhang, Jintao Li, Xiaoyuan Cao, and Sheng Tang*

- Image Retrieval Using Modified Color Variation Co-occurrence Matrix .......................................................... 42  
  *Yung-Fu Chen, Yung-Kuan Chan, Guo-Uei Chang, Meng-Chi Tsao, Yu-Jhuang Syu, and Chuen-Horng Lin*

## Fuzzy System Applications

- Tool Condition Monitoring Using the TSK Fuzzy Approach Based on Subtractive Clustering Method .......................................................... 52  
  *Qun Ren, Marek Balazinski, Luc Baron, and Krzysztof Jemielniak*

- Admissible Fuzzy Controller in $L^2$ Space .......................................................... 62  
  *Takashi Mitsushi and Yasunari Shidama*

- Application of Fuzzy Cognitive Maps for Stock Market Modeling and Forecasting .......................................................... 72  
  *Wojciech Froelich and Alicja Wakulicz-Deja*

- Fuzzy ARTMAP Neural Network for Classifying the Financial Health of a Firm .......................................................... 82  
  *Anatoli Nachev*

- Fuzzy Interpolative Reasoning Using Interval Type-2 Fuzzy Sets .......... 92  
  *Li-Wei Lee and Shyi-Ming Chen*

- Fuzzy Measurement of the Number of Persons on the Basis of the Photographic Image .......................................................... 102  
  *Dariusz Król and Michał Lower*
# Table of Contents

## Robot and Manufacturing

A Cross-Platform Robotic Architecture for Autonomous Interactive Robots

*Yasser F.O. Mohammad and Toyoaki Nishida*

Match-Up Strategies for Job Shop Rescheduling

*Patrick Moratori, Sanja Petrovic, and Antonio Vázquez*

Entropy Based Diversity Measures in Evolutionary Mobile Robot Navigation

*Tomás Arredondo V., Wolfgang Freund, and César Muñoz*

Intelligent System for Traffic Signs Recognition in Moving Vehicles

*Bogusław Cyganek*

## Data Mining and KDS

Document Clustering Based on Spectral Clustering and Non-negative Matrix Factorization

*Lei Bao, Sheng Tang, Jintao Li, Yongdong Zhang, and Wei-ping Ye*

Application of Data Mining Algorithms to TCP throughput Prediction in HTTP Transactions

*Leszek Borzemski, Marta Kliber, and Ziemowit Nowak*

Incremental Mining with Prelarge Trees

*Chun-Wei Lin, Tzung-Pei Hong, Wen-Hsiang Lu, and Been-Chian Chien*

Learning Higher Accuracy Decision Trees from Concept Drifting Data Streams

*Satoru Nishimura, Masahiro Terabe, Kazuo Hashimoto, and Koichiro Mihara*

Recommending Software Artifacts from Repository Transactions

*Joern David*

Ranking Links on the Web: Search and Surf Engines

*Jean-Louis Lassez, Ryan Rossi, and Kumar Jeev*

Cluster Analysis for Users’ Modeling in Intelligent E-Learning Systems

*Danuta Zakrzewska*
## Neural Networks

An Empirical Investigation of the Use of a Neural Network Committee for Identifying the *Streptococcus Pneumoniae* Growth Phases in Batch Cultivations .......................................................... 215  
*Antonio C.L. Horta, Teresa C. Zangirolami, Maria do Carmo Nicoletti, Luciana Montera, Talita S. Carmo, and Viviane M. Gonçalves*

Suboptimal Nonlinear Predictive Control with MIMO Neural Hammerstein Models .................................................... 225  
*Maciej Lawryńczuk*

## Machine Learning

Test Case Generation from QR Models ............................ 235  
*Harald Brandl and Franz Wotawa*

Shape-Based Human Activity Recognition Using Independent Component Analysis and Hidden Markov Model ..................... 245  
*Md. Zia Uddin, J.J. Lee, and T.-S. Kim*

Potential Distribution Modelling Using Machine Learning ........ 255  
*Ana C. Lorena, Marínez F. de Siqueira, Renato De Giovanni, André C.P.L.F. de Carvalho, and Ronaldo C. Prati*

A Cluster-Based Classification Approach to Semantic Role Labeling .... 265  
*Necati E. Ozgencil, Nancy McCracken, and Kishan Mehrotra*

Data Reduction Algorithm for Machine Learning and Data Mining .... 276  
*Ireneusz Czarnowski and Piotr Jędrzejowicz*

## Natural Language Processing

A New Word Clustering Method for Building N-Gram Language Models in Continuous Speech Recognition Systems ................ 286  
*Mohammad Bahrani, Hossein Sameti, Nazila Hafezi, and Saeedeh Momtazi*

Integrating Topic Estimation and Dialogue History for Domain Selection in Multi-domain Spoken Dialogue Systems ............ 294  
*Satoshi Ikeda, Kazunori Komatani, Tetsuya Ogata, and Hiroshi G. Okuno*

The Effect of Emotional Speech on a Smart-Home Application ...... 305  
*Theodoros Kostoulas, Iosif Mporas, Todor Ganchev, and Nikos Fakotakis*
## Internet Application and Education

Another Face of Search Engine: Web Search API's .......................... 311
*Harshit Kumar and Sanggil Kang*

The Consistency and Conformance of Web Document Collection Based on Heterogeneous DAC Graph ............................................ 321
*Marek Kopel and Aleksander Zgrzywa*

Pedagogical Protocols Selection Automatic Assistance ..................... 331
*Paola Britos, Zulma Cataldi, Enrique Sierra, and Ramón García-Martínez*

## Heuristic Search

Lagrangian-Based Solution Approaches for a Resource-Constrained Parallel Machine Scheduling Problem with Machine Eligibility Restrictions ................................................................. 337
*Emrah B. Edis, Ceyhun Araz, and Irem Ozkarahan*

A Hierarchy of Twofold Resource Allocation Automata Supporting Optimal Web Polling ................................................................. 347
*Ole-Christoffer Granmo and B. John Oommen*

A Heuristic Search for Optimal Parameter Values of Three Biokinetic Growth Models for Describing Batch Cultivations of *Streptococcus Pneumoniae* in Bioreactors ........................................... 359
*Luciana Montera, Antonio C.L. Horta, Teresa C. Zangirolami, Maria do Carmo Nicoletti, Talita S. Carmo, and Viviane M. Gonçalves*

Efficient Handling of Relational Database Combinatorial Queries Using CSPs ................................................................. 369
*Malek Mouhoub and Chang Feng*

Maintaining Population Diversity in Evolution Strategy for Engineering Problems ................................................................. 379
*Roman Dębski, Rafał Dreżewski, and Marek Kisiel-Dorohinicki*

Clustering of Gene Expression Data with Quantum-Behaved Particle Swarm Optimization ......................................................... 388
*Wei Chen, Jun Sun, Yanrui Ding, Wei Fang, and Wenbo Xu*

Ant Colony Optimization for the Single Machine Total Earliness Tardiness Scheduling Problem ..................................................... 397
*Rym M’Hallah and Ali Alhajraf*

Tuning Constrained Objects .............................................................. 408
*Ricardo Soto and Laurent Granvilliers*
## Application Systems

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology-Driven Approximate Duplicate Elimination of Postal Addresses</td>
<td>415</td>
</tr>
<tr>
<td>Matteo Cristani and Alessio Gugole</td>
<td></td>
</tr>
<tr>
<td>A Knowledge-Based System for Fashion Trend Forecasting</td>
<td>425</td>
</tr>
<tr>
<td>Paola Mello, Sergio Storari, and Bernardo Valli</td>
<td></td>
</tr>
<tr>
<td>Planning with Multiple-Components in OMPS</td>
<td>435</td>
</tr>
<tr>
<td>Amedeo Cesta, Simone Fratini, and Federico Pecora</td>
<td></td>
</tr>
<tr>
<td>The Contact Scheduling Process of the Galileo Navigation System</td>
<td>446</td>
</tr>
<tr>
<td>Tiago Franco, Flávio Moreira, Stewart Hall, and Henrique Oliveira</td>
<td></td>
</tr>
<tr>
<td>Novel Extension of $k-TSP$ Algorithm for Microarray Classification</td>
<td>456</td>
</tr>
<tr>
<td>Marcin Czajkowski and Marek Krętowski</td>
<td></td>
</tr>
<tr>
<td>Simultaneous Vehicle and Crew Scheduling for Extra Urban Transports</td>
<td>466</td>
</tr>
<tr>
<td>Benoît Laurent and Jin-Kao Hao</td>
<td></td>
</tr>
<tr>
<td>SitCom: Virtual Smart-Room Environment for Multi-modal Perceptual Systems</td>
<td>476</td>
</tr>
<tr>
<td>Jan Cuřín and Jan Kleindienst</td>
<td></td>
</tr>
<tr>
<td>Optimizing Building’s Environments Performance Using Intelligent Systems</td>
<td>486</td>
</tr>
<tr>
<td>E. Sierra, A. Hossian, D. Rodríguez, M. García-Martínez, P. Britos, and R. García-Martínez</td>
<td></td>
</tr>
</tbody>
</table>

## Agent-Based System

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualism and Collectivism in Trade Agents</td>
<td>492</td>
</tr>
<tr>
<td>Gert Jan Hofstede, Catholijn M. Jonker, and Tim Verwaart</td>
<td></td>
</tr>
<tr>
<td>Adding Attentional Capabilities Features to an Intelligent Virtual Agent</td>
<td>502</td>
</tr>
<tr>
<td>P. Brunny Troncoso, P. Ricardo Imbert, and Angélica de Antonio</td>
<td></td>
</tr>
<tr>
<td>Adaptive Power Management Based on Reinforcement Learning for Embedded System</td>
<td>513</td>
</tr>
<tr>
<td>Cheng-ting Liu and Roy Chaoming Hsu</td>
<td></td>
</tr>
<tr>
<td>Hybrid MAS GIS Coastal Systems Modeling Methodology</td>
<td>523</td>
</tr>
<tr>
<td>Dominique Urbani and Marielle Delhou</td>
<td></td>
</tr>
<tr>
<td>A Hybrid Multi-agent Model for Financial Markets</td>
<td>531</td>
</tr>
<tr>
<td>Stephen Chen, Jonathan Tien, and Brenda Spotton Visano</td>
<td></td>
</tr>
</tbody>
</table>
A Teleo-Reactive Architecture for Fast, Reactive and Robust Control of Mobile Robots ................................................................. 541
Gerhard Gubisch, Gerald Steinbauer, Martin Weiglhofer, and Franz Wotawa

Evolutionary and Genetic Algorithms

Evolutionary Public-Key Cryptographic Circuits .......................... 551
Nadia Nedjah and Luiza de Macedo Mourelle

Automatic Selection of Cutting Tools Geometry Using an Evolutionary Approach ................................................................. 561
Orlando Duran, Nibaldo Rodriguez, and Luiz Airton Consalter

Optimal Sizing and Siting of Distributed Energy Resources Considering Public and Private Incentive Policies .......................... 570
Angelo Campoccia, Eleonora Riva Sanseverino, and Gaetano Zizzo

Test Pattern Generator Design Optimization Based on Genetic Algorithm ................................................................. 580
Tomasz Garbolino and Gregor Papa

Solving Stochastic Path Problem: Particle Swarm Optimization Approach ................................................................. 590
Saeedeh Momtazi, Somayeh Kafi, and Hamid Beigy

Meta-heuristic Algorithm for the Transshipment Problem with Fixed Transportation Schedules .................................................. 601
Zhaowei Miao, Ke Fu, Qi Fei, and Fan Wang

A Dynamic Population Steady-State Genetic Algorithm for the Resource-Constrained Project Scheduling Problem .......................... 611
Mariamar Cervantes, Antonio Lova, Pilar Tormos, and Federico Barber

Knowledge Management

Access Control for XML Document ............................................. 621
Yun Bai

Extending Knowledge Base Update into First-Order Knowledge Bases ................................................................. 631
Ewa Madalińska-Bugaj and Witold Lukasiewicz

Shared Context for Knowledge Distribution: A Case Study of Collaborative Taggings .................................................. 641
Jason J. Jung
| Modelling and Automated Analysis of Organisations from the Air | 649 |
|---------------------------------------------------------------|
| Traffic Management Domain                                     |
| Alexei Sharpanskykh                                            |

| Visualized Technique for Trend Analysis of News Articles       | 659 |
|----------------------------------------------------------------|
| Masahiro Terachi, Ryosuke Saga, Zhongqi Sheng, and Hiroshi Tsuji |

| Solving SQL Constraints by Incremental Translation to SAT      | 669 |
|----------------------------------------------------------------|
| Robin Lohfert, James J. Lu, and Dongfang Zhao                  |

### Other Applications

| Using Place and Transition Fault Net Models for Sequential Diagnosis | 677 |
|---------------------------------------------------------------------|
| Time Assessment in Discrete Event Systems                           |
| Iwan Tabakow                                                        |

| A CBR-Based Approach for Ship Collision Avoidance                  | 687 |
|---------------------------------------------------------------------|
| Yuhong Liu, Chunsheng Yang, and Xuanmin Du                         |

| Multiphase Data Exchange in Distributed Logic-Algebraic Based      | 698 |
| Processing                                                         |
| Leszek Borzemski and Mariusz Fraś                                  |

| Visualization of Financial Trends Using Chance Discovery Methods   | 708 |
|---------------------------------------------------------------------|
| Tzu-Fu Chiu, Chao-Fu Hong, and Yu-Ting Chiu                        |

| A Survey on Reviewer Assignment Problem                            | 718 |
|---------------------------------------------------------------------|
| Fan Wang, Ben Chen, and Zhaowei Miao                               |

### Special Session: Knowledge Driven Manufacturing Systems

| A Declarative Framework for Constrained Search Problems            | 728 |
|---------------------------------------------------------------------|
| Paweł Sitek and Jarosław Wikarek                                    |

| Addition and Deletion of Agent Memories to Realize Autonomous      | 738 |
|---------------------------------------------------------------------|
| Decentralized Manufacturing Systems                                |
| Yamamoto Hidehiko                                                  |

| Investigation of Influence of Grinding Regimes on Surface Tension  | 749 |
|---------------------------------------------------------------------|
| State                                                              |
| Witold Halas, Victor Taranenko, Antoni Swic, and Georgij Taranenko |

| Estimating Flexibility Requirements in a Demand-Driven Lean/JIT    | 757 |
|---------------------------------------------------------------------|
| Environment                                                        |
| Peter Nielsen and Kenn Steger-Jensen                               |
Constraint Programming Approach to Time-Window and Multiresource-Constrained Projects Portfolio Prototyping .......................... 767  
Irena Bach, Grzegorz Bocewicz, and Zbigniew Banaszak

Special Session: Joint Session on Adaptive Networked Systems and Fuzzy Knowledge Bases

Adaptive E-Learning: An Architecture Based on PROSA P2P Network .................................................................................. 777  
V. Carchiolo, A. Longheu, G. Mangioni, and V. Nicosia

Real-Time Car License Plate Recognition Improvement Based on Spatiognitron Neural Network ........................................... 787  
Dariusz Król and Maciej Maksym

Handling Dynamic Networks Using Evolution in Ant-Colony Optimization ............................................................................. 795  
Christopher Roach and Ronaldo Menezes

Rule Bases Integration on the Example of a Fuzzy Model of WIG20 ................................................................. 805  
Izabela Rejer

Fuzzy Analytical Hierarchy Process in Maintenance Problem .......... 815  
Mª Socorro García-Cascales and Mª Teresa Lamata

Special Session: Software Agents and Multi-Agent Systems

Proposal for Agent Platform Dynamic Interoperation Facilitating Mechanism ............................................................... 825  
Xiaolu Li, Takahiro Uchiya, Susumu Konno, and Tetsuo Kinoshita

A Formal Framework of Conversational Goals Based on Strategic Reasoning ............................................................... 835  
Mohamed Mbarki, Jamal Bentahar, and Bernard Moulin

An Auction-Based System for Workforce Resource Allocation ........ 845  
Nadim Haque, Botond Virginas, Mathias Kern, and Gilbert Owusu

Scenario Description Language for Multi-agent Systems .................. 855  
Armin Stranjak, Igor Čavrak, and Mario Žagar

The CrocodileAgent: A Software Agent for SCM Procurement Gaming ......................................................... 865  
Tvrtko Milicic, Vedran Podobnik, Ana Petric, and Gordan Jezic

Author Index ................................................................................................. 877