

**Proceedings**

**20th IEEE International Conference  
on Tools with Artificial Intelligence  
ICTAI 2008**

**3-5 November 2008  
Dayton, Ohio, USA**

**Co-sponsored by  
IEEE Computer Society  
Biological and Artificial Intelligence Society**

**In Cooperation with  
Wright State University  
University of Patras  
Virginia Tech**



**Los Alamitos, California  
Washington • Tokyo**



## TABLE OF CONTENTS

**Messaage from the General Chairs**  
**Message from the Program Chair**  
**Conference Committees**

### **SESSION 1: KNOWLEDGE REPRESENTATION AND REASONING**

<b>Improving the Performance of Interactive Configuration with Regular String Constraints.....</b>	1
<i>Esben Rune Hansen, Peter Tiedemann</i>	
<b>The System BioC for Reasoning about Biological Models in Action Language C.....</b>	9
<i>Steve Dworschak, Torsten Grote, Arne König, Torsten Schaub, Philippe Veber</i>	
<b>Layer Compression in Decision Diagrams.....</b>	17
<i>Tarik Hadzic, Esben Rune Hansen, Barry O'Sullivan</i>	
<b>A Model for Multiple Outcomes Games.....</b>	25
<i>Ramzi Ben Larbi, Sébastien Konieczny, Pierre Marquis</i>	

### **SESSION 2: MACHINE LEARNING I**

<b>Dominance of Bayesian Networks and Efficient Learning of Generalized Latent Class Models .....</b>	33
<i>Yixin Chen, Dong Hua, Fang Liu</i>	
<b>Veritas: Combining Expert Opinions without Labeled Data.....</b>	41
<i>Sharath R. Cholleti, Sally A. Goldman, Avrim Blum, David G. Politte, Steven Don</i>	
<b>Classifying Spend Descriptions with Off-the-Shelf Learning Components .....</b>	49
<i>Saikat Mukherjee, Dmitriy Fradkin, Michael Roth</i>	
<b>Sub-class Recognition from Aggregate Class Labels: Preliminary Results .....</b>	57
<i>Ranga Raju Vatsavai, Shashi Shekhar, Budhendra Bhaduri</i>	

### **SESSION 3: TRENDS IN SAT AND CSPS**

<b>Let the Solver Deal with Redundancy .....</b>	61
<i>Cédric Piette</i>	
<b>On Approaches to Explaining Infeasibility of Sets of Boolean Clauses.....</b>	68
<i>Éric Grégoire, Bertrand Mazure, Cédric Piette</i>	
<b>From XSAT to SAT by Exhibiting Equivalencies .....</b>	78
<i>Richard Ostrowski, Lionel Paris</i>	
<b>Haplotype Inference with Boolean Constraint Solving: An Overview .....</b>	86
<i>Inês Lynce, Ana Graça, João Marques-Silva, Arlindo L. Oliveira</i>	

## **SESSION 4: KNOWLEDGE- BASED SYSTEMS I**

<b>Human-Readable and Machine-Readable Knowledge Bases Using Specialized Word Processors .....</b>	95
<i>Martin Molina, Gemma Blasco</i>	
<b>Capturing the Semantics of Online News Sources for Business Intelligence Applications.....</b>	103
<i>Peter Z. Yeh, Alex Kass</i>	
<b>XONTO: An Ontology-Based System for Semantic Information Extraction from PDF Documents.....</b>	110
<i>Ermelinda Oro, Massimo Ruffolo</i>	
<b>Group Intelligent Decision Support System for Power System Skeleton Restoration .....</b>	118
<i>Chunyi Wang, Yutian Liu</i>	

## **SESSION 5: AI IN MULTIMEDIA AND REAL-TIME SYSTEMS**

<b>Adaptive Mobile Interfaces through Grammar Induction.....</b>	122
<i>Jun Kong, Keven L. Ates, Kang Zhang, Yan Gu</i>	
<b>Application of Relevance Feedback in Content Based Image Retrieval Using Gaussian Mixture Models .....</b>	130
<i>Apostolos Marakakis, Nikolaos Galatsanos, Aristidis Likas, Andreas Stafylopatis</i>	
<b>Real-Time Classification of Streaming Sensor Data .....</b>	138
<i>Shashwati Kasetty, Candice Stafford, Gregory P. Walker, Xiaoyue Wang, Eamonn Keogh</i>	
<b>DOG: An Ontology-Powered OSGi Domotic Gateway.....</b>	146
<i>Dario Bonino, Emiliano Castellina, Fulvio Corno</i>	

## **SESSION 6: AI ALGORITHMS I**

<b>Adding Flexibility to Russian Doll Search .....</b>	150
<i>Margarita Razgon, Gregory M. Provan</i>	
<b>Comparison of Service Selection Algorithms for Grid Services: Multiple Objective Particle Swarm Optimization and Constraint Satisfaction Based Service Selection.....</b>	159
<i>Tapashree Guha, Simone A. Ludwig</i>	
<b>PHC-NSGA-II: A Novel Multi-objective Memetic Algorithm for Continuous Optimization .....</b>	167
<i>Slim Bechikh, Nabil Belgasmi, Lamjed Ben Said, Khaled Ghédira</i>	
<b>Integrating YAGO into the Suggested Upper Merged Ontology .....</b>	177
<i>Gerard de Melo, Fabian Suchanek, Adam Pease</i>	

## **SESSION 7: COLLABORATIVE SOFTWARE AGENTS**

<b>Application of Reactive Multi-agent System to Vehicle Collision Avoidance .....</b>	181
<i>Sibo Yang, Franck Gechter, Abderrafiaa Koukam</i>	
<b>Controller Agents for Constraints Solving: Implementation and Use of CACS Prototype.....</b>	189
<i>Sami Al-Maqtari, Habib Abdulrab</i>	
<b>A UML-Based Conversion Tool for Monitoring and Testing Multi-agent Systems.....</b>	196
<i>Nariman Mani, Vahid Garousi, Behrouz H. Far</i>	

<b>Agent Based Activity Monitoring System - ABAMS.....</b>	204
<i>Umar Manzoor, Samia Nefti</i>	

## **SESSION 8: VISION/IMAGE PROCESSING AND UNDERSTANDING I**

<b>A Pyramidal Neural Network Based on Nonclassical Receptive Field Inhibition .....</b>	208
<i>Bruno J. T. Fernandes, George D. C. Cavalcanti</i>	
<b>Face Recognition Using a Color Subspace LDA Approach.....</b>	212
<i>M. Thomas, C. Kambhamettu, S. Kumar</i>	
<b>Real-Time Approach for Adaptive Object Segmentation in Time-of-Flight Sensors .....</b>	217
<i>Ehsan Parvizi, Q. M. Jonathan Wu</i>	
<b>The Efficient Features for Tracking .....</b>	222
<i>Hyeongyong Jeon, Jaekyong Jeong, Joonwoon Bang, Chijung Hwang</i>	

## **SESSION 9: SEARCH AND HEURISTICS**

<b>Ant Colony Optimization for Configuration .....</b>	226
<i>Patrick Albert, Laurent Henocque, Mathias Kleiner</i>	
<b>Enhancing the Robustness/Efficiency of Local Search Algorithms for SAT .....</b>	234
<i>Djamal Habet</i>	
<b>Performing A* Search for Yard Crane Dispatching in Container Terminals.....</b>	242
<i>Xi Guo, Shell Ying Huang</i>	
<b>On the Effects of Network Structure in Population-Based Optimization .....</b>	247
<i>Ricardo M. Araujo, Luis C. Lamb</i>	

## **SESSION 10: CONSTRAINT PROGRAMMING I**

<b>Automatic Design of Robot Behaviors through Constraint Network Acquisition .....</b>	251
<i>Mathias Paulin, Christian Bessiere, Jean Sallantin</i>	
<b>Consistency Techniques for Finding an Optimal Relaxation of a Feature Subscription .....</b>	259
<i>David Lesaint, Deepak Mehta, Barry O'Sullivan, Luis Quesada, Nic Wilson</i>	
<b>Stronger Consistencies in WCSPs with Set Variables .....</b>	267
<i>J. H. M. Lee, C. F. K. Siu</i>	
<b>Extending to Soft and Preference Constraints a Framework for Solving Efficiently Structured Problems .....</b>	275
<i>Samba Ndojh Ndiaye, Philippe Jégou, Cyril Terrioux</i>	

## **SESSION 11: INFORMATION RETRIEVAL I**

<b>Fuzzy Information Retrieval Model Based on Multiple Related Ontologies .....</b>	283
<i>Maria Angelica de A. Leite, Ivan L. M. Ricarte</i>	
<b>Profile-Based Focused Crawler for Social Media-Sharing Websites.....</b>	291
<i>Zhiyong Zhang, Olfa Nasraoui</i>	
<b>Image Characterization via Multilayer Neural Networks.....</b>	299
<i>Celia A. Z. Barcelos, Eduardo F. Ribeiro, Marcos A. Batista</i>	

<b>Information Extraction by Two Dimensional Parser</b>	.....	307
<i>Atsuhiro Takasu</i>		

## **SESSION 12: SEMANTIC WEB TECHNIQUES AND TECHNOLOGIES**

<b>Learning a Probabilistic Semantic Model from Heterogeneous Social Networks for Relationship Identification</b>	.....	315
<i>Chunying Zhou, Huajun Chen, Tong Yu</i>		
<b>An End-to-End Configuration-Based Framework for Automatic SWS Composition</b>	.....	323
<i>Patrick Albert, Laurent Henocque, Mathias Kleiner</i>		
<b>Computational Complexity of Web Service Composition Based on Behavioral Descriptions</b>	.....	331
<i>Hyunyoung Kil, Wonhong Nam, Dongwon Lee</i>		
<b>Semantic Information Retrieval for Personalized E-Learning</b>	.....	336
<i>Leyla Zhuhadar, Olfa Nasraoui</i>		

## **SESSION 13: MACHINE LEARNING II**

<b>Minimum Free Energies with "Data Temperature" for Parameter Learning of Bayesian Networks</b>	.....	341
<i>Takashi Isozaki, Noriji Kato, Maomi Ueno</i>		
<b>RUSE-WARMR: Rule Selection for Classifier Induction in Multi-relational Data-Sets</b>	.....	349
<i>Carlos Abreu Ferreira, João Gama, Vítor Santos Costa</i>		
<b>Ensemble Learning of Regional Classifiers</b>	.....	357
<i>Byung-woo Lee, Yong-chan Na, Byonghwa Oh, Jihoon Yang</i>		
<b>Attribute Value Taxonomy Generation through Matrix Based Adaptive Genetic Algorithm</b>	.....	363
<i>Hyunsung Jo, Yong-chan Na, Byonghwa Oh, Jihoon Yang, Vasant Honavar</i>		

## **SESSION 14: PLANNING AND SCHEDULING I**

<b>LRNPlanner: Planning Personalized and Contextualized E-Learning Routes</b>	.....	371
<i>Eva Onaindia, Antonio Garrido, Oscar Sapena</i>		
<b>Hybrid Algorithms for Electromagnetic Detection Satellites Scheduling</b>	.....	379
<i>Hao Chen, Jun Li, Ning Jing, Yu Tang</i>		
<b>FIP: A Fast Planning-Graph-Based Iterative Planner</b>	.....	387
<i>Jicheng Fu, Farokh Bastani, Vincent Ng, I-Ling Yen, Yansheng Zhang</i>		
<b>A Memetic Algorithm for the University Course Timetabling Problem</b>	.....	395
<i>Sadaf N. Jat, Shengxiang Yang</i>		

## **SESSION 15: DATA MINING AND KNOWLEDGE DISCOVERY WITH IMBALANCED DATA**

<b>Using Imputation Techniques to Help Learn Accurate Classifiers</b>	.....	402
<i>Xiaoyuan Su, Taghi M. Khoshgoftaar, Russell Greiner</i>		
<b>Resampling or Reweighting: A Comparison of Boosting Implementations</b>	.....	410
<i>Chris Seiffert, Taghi M. Khoshgoftaar, Jason Van Hulse, Amri Napolitano</i>		

<b>Improving Learner Performance with Data Sampling and Boosting.....</b>	417
<i>Chris Seiffert, Taghi M. Khoshgoftaar, Jason Van Hulse, Amri Napolitano</i>	
<b>Addressing Class Imbalance in Non-binary Classification Problems.....</b>	425
<i>Naeem Seliya, Zhiwei Xu, Taghi M. Khoshgoftaar</i>	

## **SESSION 16: CONSTRAINT PROGRAMMING II**

<b>Finding Good Starting Points for Solving Structured and Unstructured Nonlinear Constrained Optimization Problems .....</b>	432
<i>Soomin Lee, Benjamin Wah</i>	
<b>Encoding CSPs with Zero-Suppressed Decision Diagrams .....</b>	440
<i>Esben Rune Hansen</i>	
<b>A New Evaluation of Forward Checking and Its Consequences on Efficiency of Tools for Decomposition of CSPs .....</b>	449
<i>Philippe Jégou, Samba Ndojh Ndiaye, Cyril Terrioux</i>	
<b>A New Method for Computing Suitable Tree-Decompositions with Respect to Structured CSP Solving .....</b>	454
<i>Cédric Pinto, Cyril Terrioux</i>	

## **SESSION 17: PLANNING AND SCHEDULING II**

<b>Scheduling for Dedicated Machine Constraint Using Integer Programming.....</b>	459
<i>Huy Nguyen Anh Pham, Arthur Shr, Peter P. Chen, Alan Liu</i>	
<b>TLP-GP: New Results on Temporally-Expressive Planning Benchmarks.....</b>	467
<i>F. Maris, P. Régnier</i>	
<b>A General Technique for Plan Repair.....</b>	475
<i>Marlene Arangú, Antonio Garrido, Eva Onaindia</i>	
<b>Preprocessing for Point-Based Algorithms of POMDPs.....</b>	479
<i>Ai-Hua Bian, Chong-Jun Wang, Shi-Fu Chen</i>	

## **SESSION 18: AI IN DATABASES AND DATA MINING**

<b>Peer-to-Peer Traffic Identification by Mining IP Layer Data Streams Using Concept-Adapting Very Fast Decision Tree.....</b>	483
<i>Bijan Raahemi, Weicai Zhong, Jing Liu</i>	
<b>Quantized Indexing Tree for Frequent Updates over Data Streams.....</b>	491
<i>Liang Su, Bo Wang, Peng Zou, Yan Jia, Ke Zuo, ShuQiang Yang</i>	
<b>Simultaneous Clustering and Visualization of Web Usage Data Using Swarm-Based Intelligence.....</b>	497
<i>Esin Saka, Olfa Nasraoui</i>	
<b>Feature Exploration for Mining Coronal Loops from Solar Images.....</b>	505
<i>Nurcan Durak, Olfa Nasraoui</i>	

## **SESSION 19: MACHINE LEARNING III**

<b>Visualizing Classifier Performance on Different Domains</b>	.....	509
<i>Rocio Alaiz-Rodríguez, Nathalie Japkowicz, Peter Tischer</i>		
<b>Policy Gradient Semi-markov Decision Process</b>	.....	517
<i>Ngo Anh Vien, TaeChoong Chung</i>		
<b>An Empirical Analysis on the Stability of Clustering Algorithms</b>	.....	525
<i>Reza Zafarani, Majid Makki, Ali A. Ghorbani</i>		
<b>Oracle Clustering: Dynamic Partitioning Based on Random Observations</b>	.....	533
<i>Reza Zafarani, Ali A. Ghorbani</i>		

## **SESSION 20: VISION/IMAGE PROCESSING AND UNDERSTANDING**

<b>Moving Sensor Video Image Processing Enhanced with Elimination of Ego Motion by Global Registration and SIFT</b>	.....	541
<i>Steven Hong, Ella Atkins</i>		
<b>Handwritten Digit Segmentation in Images of Historical Documents with One-Class Classifiers</b>	.....	545
<i>V. M. O. Alves, A. L. I. Oliveira, E. R. Silva_Jr., C. A. B. Mello</i>		
<b>An Incremental Hough Transform for Detecting Ellipses in Image Data Streams</b>	.....	549
<i>Sofiane Sellah, Olfa Nasraoui</i>		
<b>Automatic Image-to-Text-to-Voice Conversion for Interactively Locating Objects in Home Environments</b>	.....	553
<i>Nikolaos Bourbakis</i>		

## **SESSION 21: AI ALGORITHMS II**

<b>A New Exact Bit-Parallel Algorithm for SAT</b>	.....	560
<i>Pablo San Segundo, Cristóbal Tapia, Julio Puente, Diego Rodríguez-Losada</i>		
<b>A Unified Scoring Scheme for Detecting Essential Proteins in Protein Interaction Networks</b>	.....	567
<i>Hon Nian Chua, Kar Leong Tew, Xiao-Li Li, See-Kiong Ng</i>		
<b>Information Extraction as an Ontology Population Task and Its Application to Genic Interactions</b>	.....	575
<i>Alain-Pierre Manine, Erick Alphonse, Philippe Bessières</i>		
<b>Definition and Extraction of Causal Relations for QA on Fault Diagnosis of Devices</b>	.....	583
<i>Sheen-Mok Lee, Ji-Ae Shin</i>		

## **SESSION 22: HYBRID INTELLIGENT SYSTEMS**

<b>e-Tourism: A Tourist Recommendation and Planning Application</b>	.....	587
<i>Laura Sebastia, Inma Garcia, Eva Onaindia, Cesar Guzman</i>		
<b>Rough Set Based Learning for Classification</b>	.....	595
<i>Naohiro Ishii, Takahiro Yamada, Yongguang Bao, Hidekazu Tanaka</i>		
<b>A Hybrid Self-Organizing Model for Sequence Analysis</b>	.....	603
<i>Christos Ferles, Andreas Stafylopatis</i>		

<b>Exploiting Item Taxonomy for Solving Cold-Start Problem in Recommendation Making .....</b>	611
<i>Li-Tung Weng, Yue Xu, Yuefeng Li, Richi Nayak</i>	

## **SESSION 23: NATURAL LANGUAGE AND SPEECH PROCESSING**

<b>Exploiting Syntactic and Shallow Semantic Kernels to Improve Random Walks for Complex Question Answering.....</b>	619
<i>Yllias Chali, Shafiq R. Joty</i>	
<b>Answering Complex Questions Using Query-Focused Summarization Technique .....</b>	627
<i>Yllias Chali, Shafiq R. Joty</i>	
<b>Online Structured Learning for Semantic Parsing with Synchronous and lambda-Synchronous Context Free Grammars.....</b>	631
<i>Le-Minh Nguyen, Akira Shimazu, Xuan Hieu Phan, Phuong Thai Nguyen</i>	
<b>Robust Speaker Identification Using Greedy Kernel PCA.....</b>	639
<i>Min-Seok Kim, Il-Ho Yang, Ha-Jin Yu</i>	
<b>A Speaker Independent Approach to the Classification of Emotional Vocal Expressions.....</b>	643
<i>Hicham Atassi, Anna Esposito</i>	

## **SESSION 24: REASONING UNDER FUZZINESS OR UNCERTAINTY**

<b>Probabilistic Continuous Constraint Satisfaction Problems .....</b>	649
<i>Elsa Carvalho, Jorge Cruz, Pedro Barahona</i>	
<b>Haziness for Common Sensical Inference from Uncertain and Inconsistent Linear Knowledge Base.....</b>	657
<i>Lionel Daniel</i>	
<b>Marginal Calibration in Multi-agent Probabilistic Systems .....</b>	665
<i>Karen H. Jin, Dan Wu</i>	
<b>An Efficient Method for Probabilistic Knowledge Integration.....</b>	673
<i>Shenyong Zhang, Yun Peng, Xiaopu Wang</i>	

## **SESSION 25: KNOWLEDGE-BASED SYSTEMS II**

<b>An Intelligent Tutoring System for Training and Learning in a Virtual Environment for High-Risk Sites .....</b>	677
<i>Kahina Amokrane, Domitile Lourdeaux, Jean-Paul Barthès, Jean-Marie Burkhardt</i>	
<b>A Tool for Training Primary Health Care Medical Students: The Virtual Simulated Patient .....</b>	686
<i>Victor López, Eduardo M. Eisman, Juan Luis Castro</i>	
<b>Classifying User Behavior in Linux Sessions .....</b>	694
<i>Richard Fox, Eric Davidson</i>	
<b>KON3: A Clinical Decision Support System, in Oncology Environment, Based on Knowledge Management .....</b>	698
<i>Michele Ceccarelli, Antonio Donatiello, Dante Vitale</i>	
<b>Combining Link and Content Information for Scientific Topics Discovery .....</b>	703
<i>Nacim Fateh Chikhi, Bernard Rothenburger, Nathalie Aussenac-Gilles</i>	

## **SESSION 26: CASE-BASED REASONING AND COGNITIVE MODELING**

<b>Analysis of Methods for Novel Case Selection .....</b>	707
<i>Neil Hurley, Mi Zhang</i>	
<b>Ontological Cognitive Map.....</b>	715
<i>Lionel Chauvin, David Genest, Stéphane Loiseau</i>	
<b>Formalizing Object Typicality in Context-Aware Ontology .....</b>	723
<i>Yi Cai, Ho-fung Leung</i>	
<b>Fuzzy Logic Approach to Case Matching and Retrieval Suitable to SQL Implementation.....</b>	731
<i>Luigi Portinale, Stefania Montani</i>	
<b>Introducing Affect into Competitive Game Play .....</b>	736
<i>Maha Alabduljalil, Songhua Xu, Willard Miranker</i>	

## **SESSION 27: SEMANTIC SERVICES AND ANALYSIS**

<b>Synthesis of Relational Web Services Based on SCSDL .....</b>	741
<i>Haitao Gong, Shu Wang, Qi Wang, Philip Sheu</i>	
<b>An Approach to Relational Web Service Composition.....</b>	749
<i>Qi Wang, Phillip C-Y Sheu</i>	
<b>A Scientific Theme Emergence Detection Approach Based on Citation Graph Analysis.....</b>	757
<i>Tieyun Qian, Phillip C-Y Sheu, Shijun Li, Lina Wang</i>	
<b>A Semantic Programming Language SPL+ - A Preliminary Report .....</b>	762
<i>Zhang Guigang, Shu Wang, Xu ChengZhi, Zhiyuan Gong, Phillip C-Y Sheu</i>	
<b>Understanding Structure and Mapping Content to Semantic Models .....</b>	770
<i>Haleh Vafaie, Babak Hamidzadeh</i>	

## **SESSION 28: E-COMMERCE AND SECURITY**

<b>A Novel PSO-MP Approach for Database Replications at Edge Servers .....</b>	777
<i>Wei Hao, Jicheng Fu, I-Ling Yen, Zhonghang Xia</i>	
<b>A Decision Support Tool for Energy Storage Optimization.....</b>	785
<i>Alan Holland</i>	
<b>Random Move Tabu Search for Freight Proportion Allocation Problem .....</b>	793
<i>Andrew Lim, Hu Qin, Jing Xu, Zhou Xu</i>	
<b>Semantic-Based Access Control for Grid Data Resources in Open Grid Services Architecture - Data Access and Integration (OGSA-DAI) .....</b>	801
<i>Vineela Muppavarapu, Soon M. Chung</i>	
<b>Enhanced CAS Certificate for Metadata-Based Access Control in Grids .....</b>	809
<i>Sang M. Park, Soon M. Chung</i>	

## **SESSION 29: INFORMATION RETRIEVAL II**

<b>Extracting Non-redundant Approximate Rules from Multi-level Datasets .....</b>	816
<i>Gavin Shaw, Yue Xu, Shlomo Geva</i>	

<b>Enabling Cross Constraint Satisfaction in RDF-Based Heterogeneous Database Integration</b>	.....824
<i>Luis Martín, Alberto Anguita, Ana Jiménez, José Crespo</i>	
<b>A Lattice-Based Model for Recommender Systems</b>	.....832
<i>Shriram Narayanaswamy, Raj Bhatnagar</i>	
<b>GeoDialogue: A Software Agent Enabling Collaborative Dialogues between a User and a Conversational GIS</b>	.....840
<i>Hongmei Wang, Guoray Cai, Alan M. MacEachren</i>	
<b>XML Integrated Environment for Service-Oriented Data Management</b>	.....844
<i>Marwan Y. Maarouf, Soon M. Chung</i>	

## **SESSION 30: AI IN SOFTWARE ENGINEERING**

<b>Error Estimation Models Integrating Previous Models and Using Artificial Neural Networks for Embedded Software Development Projects</b>	.....852
<i>Kazunori Iwata, Toyoshiro Nakashima, Yoshiyuki Anan, Naohiro Ishii</i>	
<b>Preference-Aware Web Service Composition by Reinforcement Learning</b>	.....860
<i>Hongbing Wang, Pingping Tang</i>	
<b>Predicting Fault Proneness of Classes Trough a Multiobjective Particle Swarm Optimization Algorithm</b>	.....868
<i>Andre B. de Carvalho, Aurora Pozo, Silvia Vergilio, Alexandre Lenz</i>	
<b>Discovering Program's Behavioral Patterns by Inferring Graph-Grammars from Execution Traces</b>	.....876
<i>Chunying Zhao, Keven Ates, Jun Kong, Kang Zhang</i>	
<b>Mining Functional Aspects from Legacy Code</b>	.....884
<i>Amal Elkharraz, Hafedh Mili, Petko Valtchev</i>	

## **SESSION 31: MACHINE LEARNING IV**

<b>An Adaptive Strategy for Allocation of Resources with Gradually or Abruptly Changing Capacities</b>	.....894
<i>Yingni She, Ho-fung Leung</i>	
<b>An Adaptive Bidding Strategy in Multi-round Combinatorial Auctions for Resource Allocation</b>	.....902
<i>Xin Sui, Ho-Fung Leung</i>	
<b>Knee Point Detection on Bayesian Information Criterion</b>	.....910
<i>Qinpei Zhao, Mantao Xu, Pasi Fränti</i>	
<b>Clustering Inside Classes Improves Performance of Linear Classifiers</b>	.....918
<i>Dmitriy Fradkin</i>	

## **SESSION 32: NEURAL NETWORKS**

<b>Neural Network Language Models for Translation with Limited Data</b>	.....922
<i>Maxim Khalilov, José A. R. Fonollosa, F. Zamora-Martínez, M. J. Castro-Bleda, S. España-Boquera</i>	
<b>Filtering Noise in Regression Problems Using a Multiobjective Leaning Algorithm</b>	.....929
<i>D. A. G. Vieira, X. L. Travassos_Jr., Vasile Palade, R. R. Saldanha</i>	

<b>The Performance of Approximating Ordinary Differential Equations by Neural Nets .....</b>	934
<i>Josef Fojdl, Rüdiger W. Brause</i>	
<b>Constraint-Based Placement and Routing for FPGAs Using Self-Organizing Maps.....</b>	942
<i>Michail Maniatakos, Songhua Xu, Willard L. Miranker</i>	

## **SESSION 33: AI IN MEDICINE**

<b>Recognition of Neonatal Facial Expressions of Acute Pain Using Boosted Gabor Features .....</b>	947
<i>Lei Yuan, Forrest Sheng Bao, Guanming Lu</i>	
<b>A Comparative Study of Machine Learning Techniques for Caries Prediction.....</b>	951
<i>Robson D. Montenegro, Adriano L. I. Oliveira, George G. Cabral, Cintia R. T. Katz, Aronita Rosenblatt</i>	
<b>A New Approach to Automated Epileptic Diagnosis Using EEG and Probabilistic Neural Network.....</b>	956
<i>Forrest Sheng Bao, Donald Yu-Chun Lie, Yuanlin Zhang</i>	
<b>A Multimodal Interaction Scheme between a Blind User and the Tyflos Assistive Prototype.....</b>	961
<i>Nikolaos Bourbakis, Robert Keefer, Dimitrios Dakopoulos, Anna Esposito</i>	

## **SESSION 34: VISION/IMAGE PROCESSING AND UNDERSTANDING III**

<b>Automatic Object Classification through Semantic Analysis.....</b>	969
<i>Xiaokun Li, Zhigang Zhu</i>	
<b>Real-Time Positioning and Orienting of Pallets Based on Monocular Vision .....</b>	977
<i>Sungmin Byun, Minhwan Kim</i>	
<b>Contourlet Based Interest Points Detector.....</b>	981
<i>Samer R. Saydam, Ibrahim A. El rube', Amin A. Shoukry</i>	

## **SESSION 35: EVOLUTIONARY COMPUTING**

<b>Straight Line Programs: A New Linear Genetic Programming Approach .....</b>	986
<i>César L. Alonso, Jorge Puente, José Luis Montaña</i>	
<b>Solving Temporal Constraint Satisfaction Problems with Heuristic Based Evolutionary Algorithms .....</b>	994
<i>Bahareh Jafari Jashmi, Malek Mouhoub</i>	
<b>A Self-Organization Genetic Algorithm with Cycle Mutation .....</b>	999
<i>Na Wang, Jian Zhuang, Haifeng Du, Sun'an Wang</i>	
<b>Navigation and Guidance Planning for Air Vehicles .....</b>	1003
<i>Ferhat Uçan, D. Turgay Altilar</i>	

## **SESSION 36: INTELLIGENT INFORMATION PROCESSING FOR SENSING**

<b>iMASS: Computational NRF Spectra Signal from Geant4.....</b>	1008
<i>John Perry, Shanjie Xiao, Tatjana Jevremovic</i>	
<b>A NRF Spectra Signature Detection Model Using Local-Global Graphs .....</b>	1014
<i>N. Bourbakis, A. Pantelopoulos, R. Kannavara</i>	

**Context Processing of Sensory Image Data**.....1018  
*R. L. Ewing, M. D. Eyster*

**Object Recognition Using Log-Polar Wavelet Mapping**.....1026  
*Rittavee Matungka, Yuan F. Zheng, Robert L. Ewing*

**Author Index**