

**14th IEEE International Conference on  
Tools With Artificial Intelligence**

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Proceedings

# 14th IEEE International Conference on Tools with Artificial Intelligence (ICTAI 2002)

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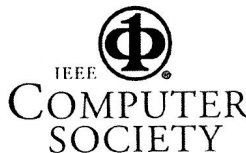
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# Message from the Program Chair

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*ICTAI 2002*

Welcome to ICTAI 2002! On behalf of the organizing and program committees, I welcome your arrival at Washington, DC, to attend the 14th IEEE Conference on Tools with AI. As in the previous 13 TAI conferences, ICTAI 2002 continues to serve as a major international forum for presenting the state-of-the-art research and practice in AI methodologies, as well as the demanding issues involved in turning these methodologies into practical tools for developing intelligent systems and applications. I am pleased to announce that this year we have an excellent and exciting program.

This year we received from academia, government, and industry sectors internationally 84 submissions, from which the program committee selected 27 regular papers after a rigorous peer review process in which each paper is reviewed by at least three program committee members. We also selected another 24 short papers to appear in the final program. In addition to a panel on AI directions and five outstanding keynote speeches, we have organized a special track of 19 invited papers covering state-of-the-art presentations of AI tools to honor Prof. C. V. Ramamoorthy for his long-standing contribution to TAI as well as to celebrate the 14 years of success of ICTAI. These papers span a wide range of topics and are being organized to appear in the following sessions:

|                                     |                                    |
|-------------------------------------|------------------------------------|
| Machine Learning                    | Natural Language Processing        |
| Data Mining and Knowledge Discovery | Multimedia and Image Processing    |
| Constraint Satisfaction             | Internet Software                  |
| Intelligent Information Retrieval   | Multi-Agents                       |
| Planning and Scheduling             | Neural Network and Applications    |
| Intelligent Real-Time Systems       | Software Engineering and Knowledge |
| Logic and Reasoning                 | Sharing                            |

This year we adopted an online web-based submission tracking and review toolset called START to streamline the paper submission and reviewing process. Because of this streaming process, we have been able to assign at least three program committee members to review each paper. We'd like to take this opportunity to thank the PC members who have served with such dedication for soliciting papers, returning review results on time, and selecting papers to be included in the final program. Special thanks are extended to Prof. C. V. Ramamoorthy for serving as General Chair of ICTAI 2002 and organizing the meeting, as well as to the keynote speakers, panelists, and authors for contributing to this year's exciting program.

**Ing-Ray Chen**  
Program Chair  
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# Conference Schedule

**Monday, Nov. 4, 2002**

|                                     |   |
|-------------------------------------|---|
| 8:45-9:00                           | Welcome   |
| 9:00-10:00<br>Shenandoah<br>I & II  | Keynote Speech I: New Areas of Applied Artificial Intelligence Research<br><i>Jeffrey J.P. Tsai</i><br>University of Illinois at Chicago, USA and<br>President, Taichung Healthcare and Management University, Taiwan   |
| 10:00-10:30                         | Coffee Break  |
| 10:30-12:30<br>Shenandoah<br>I & II | <b>Session 1-A Machine Learning I</b><br><b>Session Chair: Alex Delis, University of Athens, Greece</b><br>About Adaptive State Knowledge Extraction for Septic Shock Mortality Prediction<br><i>R. W. Brause</i><br>Updating A Hybrid Rule Base with New Empirical Source Knowledge<br><i>J. Prentzas, I. Hatzilygeroudis, and A. Tsakalidis</i><br>Data Sniffing - Monitoring of Machine Learning for Online Adaptive Systems<br><i>Y. Liu, T. Menzies, and B. Cukic</i><br>Machine Learning and Software Engineering<br><i>D. Zhang and J. J. P. Tsai</i>  |
| 10:30-12:30<br>Shenandoah<br>III    | <b>Session 1-B Data Mining and Knowledge Discovery I</b><br><b>Session Chair: Jianping Zhang, Mitre Corporation, USA</b><br>Data Mining Using Cultural Algorithms and Regional Schema<br><i>X. Jin and R. G. Reynolds</i><br>Data Mining for Selection Visualization of Large Spatial Datasets<br><i>S. Shekhar, C.-T. Lu, P. Zhang, and R. Liu</i><br>Mining Association Rules in Text Databases Using Multipass with Inverted Hashing and Pruning.<br><i>J. D. Holt and S. M. Chung</i><br>A Tool for Extracting XML Association Rules<br><i>D. Braga, A. Campi, S. Ceri, M. Klemettinen, and P. L. Lanzi</i> |
| 10:30-12:30<br>Shenandoah<br>IV     | <b>Session 1-C Constraint Satisfaction</b><br><b>Session Chair: I-Ling Yen, University of Texas at Dallas, USA.</b><br>Calculus of Variations in Discrete Space for Constrained Nonlinear Dynamic Optimization<br><i>Y. Chen and B. W. Wah</i><br>On Temporal Planning as CSP<br><i>A. D. Mali</i><br>Actions with Duration and Constraints: The Ramification Problem in Temporal Databases<br><i>N. Papadakis and D. Plexousakis</i><br>A Lazy Divide And Conquer Approach to Constraint Solving<br><i>S. Anand, W.-N. Chin, and S.-C. Khoo</i>  |
| 12:30-14:00                         | Lunch   |
| 14:00-15:00<br>Shenandoah<br>I & II | Keynote Speech II: Data Mining for Counter-Terrorism<br><i>Bhavani Thuraisingham</i><br>National Science Foundation, USA  |
| 15:00-15:30                         | Coffee Break  |
| 15:30-17:30<br>Shenandoah<br>I & II | <b>Session 2-A Intelligent Information Retrieval</b><br><b>Session Chair: Soon M. Chung, Wright State University, USA</b><br>Context Query in Information Retrieval<br><i>C.-H. Chi, C. Ding, and K.-Y. Lam</i><br>EasyTransport: An Effective Navigation and Transportation Guide for Wide Geographic Areas<br><i>M. Fragouli and A. Delis</i><br>Ontology for Knowledge Representation in a Computer-based Patient Record<br><i>E. Bayegan, O. Nytro, and A. Grimsno</i><br>Ontology Construction for Information Selection<br><i>L. Khan and F. Luo</i>  |

|                                  |  |
|----------------------------------|--|
| 15:30-17:30<br>Shenandoah<br>III | <b>Session 2-B Planning and Scheduling I</b><br><b>Session Chair: Robert G. Reynolds, Wayne State University, USA</b>                                  |
|                                  | Application of AI Planning Techniques to Automated Code Synthesis and Testing<br><i>I.-L. Yen, F. B. Bastani, F. Mohamed, and H. Ma</i>                |
|                                  | Distributed Graphplan<br><i>M. Iwen and A. D. Mali</i>   |
|                                  | Crane Scheduling Using Tabu Search<br><i>A. Lim, B. Rodrigues, F. Xiao, and Y. Zhu</i>   |
|                                  | An Intelligent Brokering System to Support Multi-Agent Web-Based Fourth-Party Logistics<br><i>H. C. Lau and Y. G. Goh</i>                              |
| 15:30-17:30<br>Shenandoah<br>IV  | <b>Session 2-C Intelligent Real-Time Systems</b><br><b>Session Chair: Bojan Cukic, West Virginia University, USA</b>                                   |
|                                  | A TMO Based Approach to Structuring Real-Time Agents<br><i>K. H. Kim</i>   |
|                                  | Selection Process of Intelligent Decision Support Tool for a Real-time Monitoring System<br><i>H. Vafaie, M. Shaughnessy, T. Bethem, and J. Burton</i> |
|                                  | Diagnosis of Component Failures in the Space Shuttle Main Engines Using Bayesian Belief Networks: A Feasibility Study<br><i>E. Liu and D. Zhang</i>    |
|                                  | Dynamic Refinement of Classification Rules<br><i>K. K. Manchi and X. Wu</i>  |

## Tuesday, Nov. 5, 2002

|                                     |   |
|-------------------------------------|---|
| 9:00-10:00<br>Shenandoah<br>I & II  | Keynote Speech III: TBA   |
| 10:00-10:30                         | Coffee Break  |
| 10:30-12:30<br>Shenandoah<br>I & II | <b>Session 3-A Planning and Scheduling II</b><br><b>Session Chair: Haleh Vafaie, Northrop Grumman Information Technology, USA</b>             |
|                                     | DSatz: A Directional SAT Solver for Planning<br><i>M. Iwen and A. D. Mali</i>   |
|                                     | Maintenance Scheduling of Oil Storage Tanks Using Tabu-based Genetic Algorithm<br><i>S.T. Li, C.K. Ting, C. Lee, and S.C. Chen</i>            |
|                                     | Transportation Modeling: An Artificial Life Approach<br><i>P. Lučić and D. Teodorović</i>   |
|                                     | Adjusted Network Flow for the Shelf-Space Allocation Problem<br><i>A. Lim, B. Rodrigues, F. Xiao, and X. Zhang</i>                            |
| 10:30-12:30<br>Shenandoah<br>III    | <b>Session 3-B Machine Learning II</b><br><b>Session Chair: Xindong Wu, University of Vermont, USA</b>  |
|                                     | Error-Based Pruning of Decision Trees Grown on Very Large Data Sets Can Work!<br><i>L. O. Hall, R. Collins, K. W. Bowyer, and R. Banfield</i> |
|                                     | Improving the Orthogonal Range Search k-windows Algorithm<br><i>P. Alevizos, B. Boutsinas, D. Tasoulis, and M. N. Vrahatis</i>                |
|                                     | Machine Learning for Software Engineering: Case Studies in Software Reuse<br><i>J. S. Di Stefano and T. Menzies</i>                           |
|                                     | Protein Secondary Structure Prediction with Bayesian Learning Method<br><i>P. -L. Wang and D. Zhang</i>                                       |
| 10:30-12:30<br>Shenandoah<br>IV     | <b>Session 3-C Logic and Reasoning</b><br><b>Session Chair: Dan Cooke, Texas Tech, USA</b>  |
|                                     | Software Measurement Data Analysis Using Memory-Based Reasoning<br><i>R. A. Paul, F. B. Bastani, V. U. B. Challagula, and I. -L. Yen</i>      |
|                                     | Object-based Representation and Classification of Spatial Structures and Relations<br><i>F. Le Ber and A. Napoli</i>                          |
|                                     | Automatic Analysis of Composite Solvers<br><i>E. Petrov and E. Monfroy</i>  |
|                                     | A Tool for Belief Updating over Time in Bayesian Networks<br><i>J. Yang, C. K. Mohan, K. G. Mehrotra and P. K. Varshney</i>                   |
| 12:30-14:00                         | Lunch   |

|                                     |   |
|-------------------------------------|---|
| 14:00-16:00<br>Shenandoah<br>I & II | <b>Session 4-A Natural Language Processing</b><br><b>Session Chair: Chilukuri Krishna Mohan, Syracuse University, USA</b>                       |
|                                     | Combining Finite State Automata and a Greedy Learning Algorithm to Determine the Syntactic Roles of Commas<br><i>S. van Delden and F. Gomez</i> |
|                                     | Automated Diagnosis of Non-Native English Speakers' Natural Language<br><i>R. Fox and M. Bowden</i>   |
|                                     | Logic Grammars for Diagnosis and Repair<br><i>H. Christiansen and V. Dahl</i>   |
|                                     | Reasoning on Aspectual Temporal Information in French within Conceptual Graphs<br><i>T. Amaghar, D. Battistelli, and T. Charnios</i>            |
| 14:00-16:00<br>Shenandoah<br>III    | <b>Session 4-B Multimedia and Image Processing</b><br><b>Session Chair: Du Zhang, California State University, USA</b>                          |
|                                     | Word Endpoint Correction Techniques for a Text-to-Multimedia Composition System<br><i>K. Turkowski, B. Hamidzadeh, and R. Ward</i>              |
|                                     | Projecting Our Presence in Space and in Time<br><i>D. E. Cooke</i>  |
|                                     | A Clustering Based Approach to Efficient Image Retrieval<br><i>R. Zhang and Z. Zhang</i>  |
|                                     | Active Tracking and Cloning of Facial Expressions Using Spatio-Temporal Information<br><i>L. Yin, A. Basu and M. T. Yourst</i>                  |
| 14:00-16:00<br>Shenandoah<br>IV     | Detecting Similarities and Differences in Images Using the PFF and LGG Approaches<br><i>N. Bourbakis</i>  |
|                                     | <b>Session 4-C Data Mining and Knowledge Discovery II</b><br><b>Session Chair: Lawrence Hall, University of South Florida, USA</b>              |
|                                     | Software Quality Classification Modeling Using The SPRINT Decision Tree Algorithm<br><i>T. M. Khoshgoftaar and N. Seliya</i>                    |
|                                     | TimeSleuth: A Tool for Discovering Causal and Temporal Rules<br><i>K. Karimi and H. J. Hamilton</i>   |
|                                     | Mining Characteristic Rules for Understanding Simulation Data<br><i>J. Zhang, J. Bala, P. S. Barry, T. E. Meyer, and S. K. Johnson</i>          |
| 16:00-16:30                         | A Framework for Adaptive Mail Classification<br><i>G. Manco, E. Masciari, and A. Tagarelli</i>  |
|                                     | Coffee Break  |
| 16:30-18:00<br>Shenandoah<br>I & II | <b>Panel on AI Directions</b><br><b>Moderator: N. Bourbakis, Wright State University, USA</b>   |
| 18:00-18:30                         | Break   |
| 18:30-20:30                         | Conference Dinner<br>Keynote Speech IV: TBA   |

### Wednesday, Nov. 6, 2002

|                                     |   |
|-------------------------------------|---|
| 9:00-10:00<br>Shenandoah<br>I & II  | Keynote Speech V: Design of Interdisciplinary Systems/Services<br><i>Hiroshi Yamaguchi</i><br>NEC, Japan                            |
| 10:00-10:30                         | Coffee Break  |
| 10:30-12:30<br>Shenandoah<br>I & II | <b>Session 5-A Internet Software</b><br><b>Session Chair: Raymond Paul, Department of Defense, USA</b>                              |
|                                     | Building Secure Survivable Semantic Webs<br><i>B. Thuraisingham</i>   |
|                                     | Automatic Repairing of Web Wrappers by Combining Redundant Views<br><i>B. Chidlovskii</i>   |
|                                     | NeuroWeb: An Internet-Based Neural Network Simulator<br><i>E. Schikuta</i>  |
|                                     | An Agent-based Approach to Inference Prevention in Distributed Database Systems<br><i>J. Tracy, L.W. Chang, and I. S. Moskowitz</i> |

|                                     |   |
|-------------------------------------|---|
| 10:30-12:30<br>Shenandoah<br>III    | <b>Session 5-B Planning and Scheduling III</b><br><b>Session Chair: Shu-Ching Chen, Florida International University, USA</b>                                   |
|                                     | Interactive Verification of Game Design and Playing Strategies<br><i>D. Kalles and E. Ntoutsis</i>  |
|                                     | Metric Estimation via a Fuzzy Grade-of-Membership Model Applied to Analysis of Business Opportunities<br><i>B. G. Talbot, B. B. Whitehead, and L. M. Talbot</i> |
|                                     | Local Search Algorithms to Improve the Local Search<br><i>M. Tounsi and P. David</i>  |
|                                     |   |
| 10:30-12:30<br>Shenandoah<br>IV     | <b>Session 5-C Multi-Agents</b><br><b>Session Chair: Rudiger W. Brause, J.W.Goethe-University, Germany</b>  |
|                                     | The Semantics of Proactive Communication Acts Among Team-based Agents<br><i>J. Yen and X. Fan</i>   |
|                                     | Agent Warehouse: A New Paradigm for Mobile Agent Deployment<br><i>C.-H. Chi, J. Sim, and K.-Y. Lam</i>  |
|                                     | Cooperative Co-learning: A Model-based Approach for Solving Multi Agent Reinforcement Problems<br><i>B. Scherrer and F. Charpillet</i>                          |
|                                     | Reinforcement Learning in Multiagent Systems: A Modular Fuzzy Approach with Internal Model Capabilities<br><i>M. Kaya and R. Alhajj</i>                         |
|                                     |   |
| 12:30-14:00                         | Lunch   |
| 14:00-16:00<br>Shenandoah<br>I & II | <b>Session 6-A Neural Network and Applications</b><br><b>Session Chair: LiWu Chang, Naval Research Lab, USA</b>   |
|                                     | Hiding a Logo Watermark into Multiwavelet Domain Using Neural Networks<br><i>J. Zhang, N. Wang, and F. Xiong</i>  |
|                                     | Function Approximation Using Robust Wavelet Neural Networks<br><i>S.T. Li and S.C. Chen</i>   |
|                                     | A Neural-Network Approach to Modeling and Analysis<br><i>Z.Y. Chen, C.W. Chen, W.L. Chiang, and J.D. Hwang</i>  |
|                                     | A Trace-Scaling Agent for Parallel Application Tracing<br><i>F. Freitag, J. Caubet, and J. Labarta</i>  |
|                                     | A Neural Network-based Image Segmentation Tool for Color Images<br><i>D. Goldman, M. Yang, and N. Bourbakis</i>   |
|                                     |   |
| 14:00-16:00<br>Shenandoah<br>III    | <b>Session 6-B Software Engineering and Knowledge Sharing</b><br><b>Session Chair: Dusan Teodorović, Virginia Tech, USA</b>                                     |
|                                     | Study For Fusion Of different Sources To Determine Relevance<br><i>C. H. Chi, C. Ding, and K. Y. Lam</i>  |
|                                     | A Genetic Testing Framework for Digital Integrated Circuits<br><i>X. Yu, A. Fin, F. Fummi, and E. M. Rudnick</i>  |
|                                     | EER-ConceptTool: A "Reasonable" Environment for Schema and Ontology Sharing<br><i>H. Meisel and E. Compatangelo</i>   |
|                                     | Fusing Cooperative Technical-Specification Knowledge Components<br><i>É. Grégoire</i>   |
|                                     | Evolution and Evaluation of Software Quality Models<br><i>C. V. Ramamoorthy</i>   |

# Contents

## 14th IEEE International Conference on Tools with Artificial Intelligence

**ICTAI 2002**

|                                      |         |
|--------------------------------------|---------|
| Message from the Program Chair ..... | xii     |
| Organizing Committee .....           | xiii    |
| Program Committee .....              | xiv–xv  |
| Reviewers .....                      | xvi     |
| Conference Schedule .....            | xvii–xx |

### Keynote Speeches

Keynote Speech I: New Areas of Applied Artificial Intelligence Research  
*Jeffrey J. P. Tsai, University of Illinois at Chicago, USA, and*  
*President, Taichung Healthcare and Management University, Taiwan*

Keynote Speech II: Data Mining for Counter-Terrorism  
*Bhavani Thuraisingham, National Science Foundation, USA*

Keynote Speech III: To be announced

Keynote Speech IV: To be announced

Keynote Speech V: Design of Interdisciplinary Systems/Services  
*Hiroshi Yamaguchi, NEC, Japan*

### Session 1-A Machine Learning I

Chair: *Alex Delis, University of Athens, Greece*

|   |    |
|---|----|
| About Adaptive State Knowledge Extraction for Septic Shock Mortality Prediction ..... | 3  |
| <i>R. W. Brause</i>   |    |
| Updating a Hybrid Rule Base with New Empirical Source Knowledge .....                 | 9  |
| <i>J. Prentzas, I. Hatzilygeroudis, and A. Tsakalidis</i>                             |    |
| Data Sniffing—Monitoring of Machine Learning for Online Adaptive Systems .....        | 16 |
| <i>Y. Liu, T. Menzies, and B. Cukic</i>   |    |
| Machine Learning and Software Engineering .....                                       | 22 |
| <i>D. Zhang and J. J. P. Tsai</i>   |    |

---

## **Session 1-B**

### **Data Mining and Knowledge Discovery I**

Chair: *Jianping Zhang, Mitre Corporation, USA*

|   |    |
|---|----|
| Data Mining Using Cultural Algorithms and Regional Schemata.....                                      | 33 |
| <i>X. Jin and R. G. Reynolds</i>  |    |
| Data Mining for Selective Visualization of Large Spatial Datasets.....                                | 41 |
| <i>S. Shekhar, C.-T. Lu, P. Zhang, and R. Liu</i>   |    |
| Mining Association Rules in Text Databases Using Multipass with Inverted Hashing<br>and Pruning ..... | 49 |
| <i>J. D. Holt and S. M. Chung</i>   |    |
| A Tool for Extracting XML Association Rules .....   | 57 |
| <i>D. Braga, A. Campi, S. Ceri, M. Klemettinen, and P. L. Lanzi</i>                                   |    |

---

## **Session 1-C**

### **Constraint Satisfaction**

Chair: *I-Ling Yen, University of Texas at Dallas, USA*

|   |    |
|---|----|
| Calculus of Variations in Discrete Space for Constrained Nonlinear Dynamic Optimization ..... | 67 |
| <i>Y. Chen and B. W. Wah</i>  |    |
| On Temporal Planning as CSP.....  | 75 |
| <i>A. D. Mali</i>   |    |
| Actions with Duration and Constraints: The Ramification Problem in Temporal Databases.....    | 83 |
| <i>N. Papadakis and D. Plexousakis</i>  |    |
| A Lazy Divide and Conquer Approach to Constraint Solving.....                                 | 91 |
| <i>S. Anand, W.-N. Chin, and S.-C. Khoo</i>   |    |

---

## **Session 2-A**

### **Intelligent Information Retrieval**

Chair: *Soon M. Chung, Wright State University, USA*

|  |     |
|--|-----|
| Context Query in Information Retrieval.....  | 101 |
| <i>C.-H. Chi, C. Ding, and K.-Y. Lam</i>   |     |
| EasyTransport: An Effective Navigation and Transportation Guide for Wide Geographic Areas..... | 107 |
| <i>M. Fragouli and A. Delis</i>  |     |
| Ontologies for Knowledge Representation in a Computer-Based Patient Record .....               | 114 |
| <i>E. Bayegan, Ø. Nytro, and A. Grimsø</i>   |     |
| Ontology Construction for Information Selection.....   | 122 |
| <i>L. Khan and F. Luo</i>  |     |

---

## Session 2-B Planning and Scheduling I

Chair: Robert G. Reynolds, Wayne State University, USA

|   |     |
|---|-----|
| Application of AI Planning Techniques to Automated Code Synthesis and Testing .....                     | 131 |
| <i>I.-L. Yen, F. B. Bastani, F. Mohamed, H. Ma, and J. Linn</i>   |     |
| Distributed Graphplan.....  | 138 |
| <i>M. Iwen and A. D. Mali</i>   |     |
| Crane Scheduling Using Tabu Search.....   | 146 |
| <i>A. Lim, B. Rodrigues, F. Xiao, and Y. Zhu</i>  |     |
| An Intelligent Brokering System to Support Multi-Agent Web-Based 4 <sup>th</sup> -Party Logistics ..... | 154 |
| <i>H. C. Lau and Y. G. Goh</i>  |     |

---

## Session 2-C Intelligent Real-Time Systems

Chair: Bojan Cukic, West Virginia University, USA

|   |     |
|---|-----|
| A TMO Based Approach to Structuring Real-Time Agents.....   | 165 |
| <i>K. H. Kim</i>  |     |
| Selection Process of Intelligent Decision Support Tool for a Real-Time Monitoring System.....                               | 173 |
| <i>H. Vafaie, M. Shaughnessy, T. Bethem, and J. Burton</i>  |     |
| Diagnosis of Component Failures in the Space Shuttle Main Engines Using Bayesian Belief Networks: A Feasibility Study ..... | 181 |
| <i>E. Liu and D. Zhang</i>  |     |
| Dynamic Refinement of Classification Rules .....  | 189 |
| <i>K. K. Manchi and X. Wu</i>   |     |

---

## Session 3-A Planning and Scheduling II

Chair: Haleh Vafaie, Northrop Grumman Information Technology, USA

|  |     |
|--|-----|
| DSatz: A Directional SAT Solver for Planning.....                                    | 199 |
| <i>M. Iwen and A. D. Mali</i>  |     |
| Maintenance Scheduling of Oil Storage Tanks Using Tabu-Based Genetic Algorithm ..... | 209 |
| <i>S.-T. Li, C.-K. Ting, C. Lee, and S.-C. Chen</i>                                  |     |
| Transportation Modeling: An Artificial Life Approach .....                           | 216 |
| <i>P. Lučić and D. Teodorović</i>  |     |
| Adjusted Network Flow for the Shelf-Space Allocation Problem.....                    | 224 |
| <i>A. Lim, B. Rodrigues, F. Xiao, and X. Zhang</i>                                   |     |

---

### **Session 3-B**

#### **Machine Learning II**

Chair: Xindong Wu, University of Vermont, USA

|  |     |
|--|-----|
| Error-Based Pruning of Decision Trees Grown on Very Large Data Sets Can Work!..... | 233 |
| <i>L. O. Hall, R. Collins, K. W. Bowyer, and R. Banfield</i>                       |     |
| Improving the Orthogonal Range Search <i>k</i> -Windows Algorithm .....            | 239 |
| <i>P. Alevizos, B. Boutsinas, D. Tasoulis, and M. N. Vrahatis</i>                  |     |
| Machine Learning for Software Engineering: Case Studies in Software Reuse .....    | 246 |
| <i>J. S. Di Stefano and T. Menzies</i>   |     |
| Protein Secondary Structure Prediction with Bayesian Learning Method .....         | 252 |
| <i>P.-L. Wang and D. Zhang</i>   |     |

---

### **Session 3-C**

#### **Logic and Reasoning**

Chair: Dan Cooke, Texas Tech, USA

|  |     |
|--|-----|
| Software Measurement Data Analysis Using Memory-Based Reasoning .....                    | 261 |
| <i>R. A. Paul, F. B. Bastani, V. U. B. Challagula, and I.-L. Yen</i>                     |     |
| Object-Based Representation and Classification of Spatial Structures and Relations ..... | 268 |
| <i>F. Le Ber and A. Napoli</i>   |     |
| Automatic Analysis of Composite Solvers .....  | 276 |
| <i>E. Petrov and E. Monfroy</i>  |     |
| A Tool for Belief Updating over Time in Bayesian Networks .....                          | 284 |
| <i>J. Yang, C. K. Mohan, K. G. Mehrotra, and P. K. Varshney</i>                          |     |

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### **Session 4-A**

#### **Natural Language Processing**

Chair: Chilukuri Krishna Mohan, Syracuse University, USA

|   |     |
|---|-----|
| Combining Finite State Automata and a Greedy Learning Algorithm to Determine the Syntactic Roles of Commas..... | 293 |
| <i>S. van Delden and F. Gomez</i>   |     |
| Automated Diagnosis of Non-Native English Speaker's Natural Language .....                                      | 301 |
| <i>R. Fox and M. Bowden</i>   |     |
| Logic Grammars for Diagnosis and Repair .....   | 307 |
| <i>H. Christiansen and V. Dahl</i>  |     |
| Reasoning on Aspectual-Temporal Information in French within Conceptual Graphs .....                            | 315 |
| <i>T. Amghar, D. Battistelli, and T. Charnois</i>   |     |

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## **Session 4-B** **Multimedia and Image Processing**

Chair: Du Zhang, California State University, USA

|  |     |
|--|-----|
| Word Endpoint Correction Techniques for a Text-to-Multimedia Composition System.....     | 325 |
| <i>K. Turkowski, B. Hamidzadeh, and R. Ward</i>  |     |
| Projecting Our Presence in Space and in Time .....                                       | 333 |
| <i>D. E. Cooke</i>   |     |
| A Clustering Based Approach to Efficient Image Retrieval.....                            | 339 |
| <i>R. Zhang and Z. Zhang</i>   |     |
| Active Tracking and Cloning of Facial Expressions Using Spatio-Temporal Information..... | 347 |
| <i>L. Yin, A. Basu, and M. T. Yourst</i>   |     |
| Detecting Similarities and Differences in Images Using the PFF and LGG Approaches.....   | 355 |
| <i>N. Bourbakis</i>  |     |

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## **Session 4-C** **Data Mining and Knowledge Discovery II**

Chair: Lawrence Hall, University of South Florida, USA

|   |     |
|---|-----|
| Software Quality Classification Modeling Using the SPRINT Decision Tree Algorithm ..... | 365 |
| <i>T. M. Khoshgoftaar and N. Seliya</i>   |     |
| TimeSleuth: A Tool for Discovering Causal and Temporal Rules .....                      | 375 |
| <i>K. Karimi and H. J. Hamilton</i>   |     |
| Mining Characteristic Rules for Understanding Simulation Data .....                     | 381 |
| <i>J. Zhang, J. Bala, P. S. Barry, T. E. Meyer, and S. K. Johnson</i>                   |     |
| A Framework for Adaptive Mail Classification.....                                       | 387 |
| <i>G. Manco, E. Masciari, and A. Tagarelli</i>  |     |

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## **Panel Session** **AI Directions**

Moderator: Nikolaos Bourbakis, Wright State University, USA

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## **Session 5-A** **Internet Software**

Chair: Raymond Paul, Department of Defense, USA

|  |     |
|--|-----|
| Building Secure Survivable Semantic Webs.....                          | 395 |
| <i>B. Thuraisingham</i>  |     |
| Automatic Repairing of Web Wrappers by Combining Redundant Views ..... | 399 |
| <i>B. Chidlovskii</i>  |     |