

# Table of Contents

## Invited Presentations

Model Checking and Abstraction.....	1
<i>Robert P. Kurshan (Cadence Design Systems)</i>	
Reformulaion in Planning .....	18
<i>Derek Long, Maria Fox, Muna Hamdi (University of Durham)</i>	
Spatiotemporal Abstraction of Stochastic Sequential Processes .....	33
<i>Sridhar Mahadevan (University of Massachusetts)</i>	
State Spate Relaxation and Search Strategies in Dynamic Programming .....	51
<i>Aristide Mingozzi (University of Bologna)</i>	

## Full Presentations

Admissible Moves in Two-Player Games .....	52
<i>Tristan Cazenave (Université Paris 8)</i>	
Dynamic Bundling: Less Effort for More Solutions .....	64
<i>Berthe Y. Choueiry, Amy M. Davis (University of Nebraska-Lincoln)</i>	
Symbolic Heuristic Search Using Decision Diagrams .....	83
<i>Eric Hansen, Rong Zhou (Mississippi State University), Zhengzhu Feng (University of Massachusetts)</i>	
On the Construction of Human-Automation Interfaces by Formal Abstraction.....	99
<i>Michael Heymann (Technion), Asaf Degani (NASA Ames)</i>	
Pareto Optimization of Temporal Decisions .....	116
<i>Lina Khatib, Paul Morris, Robert Morris (NASA Ames)</i>	
An Information-Theoretic Characterization of Abstraction in Diagnosis and Hypothesis Selection .....	126
<i>T.K. Satish Kumar (Stanford University)</i>	
A Tractable Query Cache by Approximation .....	140
<i>Daniel Miranker (University of Texas), Malcolm C. Taylor (Radiant Networks), Anand Padmanaban (Oracle)</i>	
An Algebraic Framework for Abstract Model Checking .....	152
<i>Supratik Mukhopadhyay, Andreas Podelski (Max-Planck Institut für Informatik)</i>	
Action Timing Discretization with Iterative-Refinement .....	170
<i>Todd W. Neller (Gettysburg College)</i>	

Formalizing Approximate Objects and Theories: Some Initial Results .....	178
<i>Aarati Parmar (Stanford University)</i>	
Model Minimization in Hierarchical Reinforcement Learning .....	196
<i>Balaraman Ravindran, Andrew G. Barto (University of Massachusetts)</i>	
Learning Options in Reinforcement Learning .....	212
<i>Martin Stolle, Doina Precup (McGill University)</i>	
Approximation Techniques for Non-linear Problems with Continuum of Solutions.....	224
<i>Xuan-Ha Vu, Djamila Sam-Haroud, Marius-Calin Silaghi (Swiss Federal Institute of Technology)</i>	
Approximation of Relations by Propositional Formulas: Complexity and Semantics.....	242
<i>Bruno Zanuttini (Université de Caen)</i>	
Abstracting Visual Percepts to Learn Concepts .....	256
<i>Jean-Daniel Zucker, Nicolas Bredeche (Université Paris VI), Lorenza Saitta (Università del Piemonte Orientale)</i>	
<b>Short Presentations</b>	
PAC Meditation on Boolean Formulas .....	274
<i>Bruno Apolloni, Fabio Baraghini (Università degli Studi di Milano), Giorgio Palmas (ST Microelectronics)</i>	
On the Reformulation of Vehicle Routing Problems and Scheduling Problems .....	282
<i>J. Christopher Beck (University College, Cork), Patrick Prosser, Evgeny Selensky (University of Glasgow)</i>	
The Oracular Constraints Method .....	290
<i>T.K. Satish Kumar (Stanford University), Richard Dearden (NASA Ames)</i>	
Performance of Lookahead Control Policies in the Face of Abstractions and Approximations .....	299
<i>Ilya Levner, Vadim Bulitko, Omid Madani, Russell Greiner (University of Alberta)</i>	
TTree: Tree-Based State Generalization with Temporally Abstract Actions .....	308
<i>William T.B. Uther, Manuela M. Veloso (Carnegie Mellon University)</i>	
Ontology-Driven Induction of Decision Trees at Multiple Levels of Abstraction ...	316
<i>Jun Zhang, Adrian Silvescu, Vasant Honavar (Iowa State University)</i>	

## Research Summaries

Abstracting Imperfect Information Game Trees.....	324
<i>Darse Billings (University of Alberta)</i>	
Using Abstraction for Heuristic Search and Planning .....	326
<i>Adi Botea (University of Alberta)</i>	
Approximation Techniques in Multiagent Learning .....	328
<i>Michael Bowling (Carnegie Mellon University)</i>	
Abstraction and Reformulation in GraphPlan .....	330
<i>Daniel Buettner (University of Nebraska-Lincoln)</i>	
Abstract Reasoning for Planning and Coordination .....	331
<i>Bradley J. Clement (Jet Propulsion Laboratory)</i>	
Abstraction Techniques, and Their Value .....	333
<i>Irit Askira Gelman (The University of Arizona)</i>	
Reformulation of Non-binary Constraints .....	335
<i>Robert Glaubius (University of Nebraska-Lincoln)</i>	
Reformulating Combinatorial Optimization as Constraint Satisfaction .....	336
<i>T.K. Satish Kumar (Stanford University)</i>	
Autonomous Discovery of Abstractions through Interaction with an Environment.....	338
<i>Amy McGovern (University of Massachusetts)</i>	
Interface Verification: Discrete Abstractions of Hybrid Systems .....	340
<i>Meeko Oishi (Stanford University)</i>	
Learning Semi-lattice Codebooks for Image Compression.....	342
<i>Yoshiaki Okubo (Hokkaido University), Xiaobo Li (University of Alberta)</i>	
Research Summary.....	344
<i>Marc Pickett (University of Massachusetts)</i>	
Principled Exploitation of Heuristic Information .....	345
<i>Wheeler Ruml (Harvard University)</i>	
Reformulation of Temporal Constraint Networks .....	347
<i>Lin Xu (University of Nebraska-Lincoln)</i>	
<b>Author Index .....</b>	<b>349</b>