Fourteenth International Conference on Automated Planning and Scheduling

Whistler, British Columbia, Canada
June 3–7, 2004

ICAPS 2004
Conference Program
## ICAPS 2004 at a Glance

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<td>Morning Tutorials</td>
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<td>Friday, June 4</td>
<td>Registration</td>
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<td>Planning Competition Results &amp; Awards</td>
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<td>Saturday, June 5</td>
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<td>Sunday, June 6</td>
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<td>Monday, June 7</td>
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## ICAPS 2004 Program

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<td>9:00 AM – 1:00 PM</td>
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<tr>
<td>“Planning and Learning”</td>
<td>“Integrating Planning into Scheduling”</td>
<td>Opening Remarks</td>
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<td>Spearhead B</td>
<td>Spearhead A</td>
<td>Session Chair: Shlomo Zilberstein</td>
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<td>“Constraint Satisfaction for Planning and Scheduling”</td>
<td>“Connecting Planning Theory with Practice”</td>
<td>Rainbow Theatre</td>
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<td>Tantalus</td>
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<td>“Planning on the Web”</td>
<td>“Planning and Scheduling for Web and Grid Services”</td>
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<td>11:00 AM – 1:00 PM Morning Tutorials Continue</td>
<td>11:00 AM – 12:30 PM Workshops Continue</td>
<td>10:25 AM – 12:05 PM</td>
<td>10:30 – 11:30 AM</td>
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<td>11:00 AM – 12:30 PM</td>
<td>“Cognitive Robotics”</td>
<td>Invited Speaker: Michaela Milano</td>
<td>Invited Speaker: Reid Simmons</td>
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<td>Doctoral Consortium Meeting</td>
<td>Session Chair: Thomas Lukasiewicz</td>
<td>Session Chair: Sven Koenig</td>
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<td>1:00 – 2:00 PM Lunch Break</td>
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<td><strong>ICAPS Afternoon Tutorials</strong></td>
<td>2:00 – 6:00 PM</td>
<td>1:30 – 3:10 PM</td>
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<td>2:00 – 6:00 PM</td>
<td>Workshops Continue</td>
<td>“Knowledge in Planning”</td>
<td>“Planning and Scheduling Applications”</td>
<td>“Model Checking and Plan Recognition”</td>
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<td>“Robot Motion Planning”</td>
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<td>Session Chair: Adele Howe</td>
<td>Session Chair: Nicola Muscettola</td>
<td>Session Chair: Vincent Vidal</td>
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<td>3:30 – 5:00 PM Workshops Continue</td>
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<td>“Search in Planning and Scheduling”</td>
<td>“Probabilistic Planning”</td>
<td>“Nondeterministic Planning”</td>
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<td>Session Chair: Robert Holte</td>
<td>Session Chair: Paolo Traverso</td>
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<td>6:00 – 8:00 PM ICAPS Reception</td>
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<td>7:00 – 10:00 PM ICAPS Banquet</td>
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ICAPS Technical Sessions

Saturday, June 5

Cognitive Robotics
Extending the Knowledge-Based Approach to Planning with Incomplete Information and Sensing
R. P. Petrick and F. Bacchus

Knowledge of Other Agents and Communicative Actions in the Fluent Calculus*
Yves Martin, I. Narasamdy, and M. Thielscher

Precondition Control and the Progression Algorithm*
A. Gabaldon

A Preference-Based Interpretation of Other Agents’ Actions*
J. Lang

Knowledge in Planning
From Hybrid Systems to Universal Plans via Domain Compilation
A. Barrett

Planning Graphs and Knowledge Compilation*
H. Geffner

Domain-Specific Preferences for Causal Reasoning and Planning*
J. P. Delgrande, T. Schaub, and H. Tompits

Learning Probabilistic Relational Planning Rules
H. M. Pasula, L. S. Zettlemoyer, and L. P. Kaelbling

Search in Planning and Scheduling
An Improved Integer Local Search for Complex Scheduling Problems
W. Zhang and X. Zhang

Breadth-First Heuristic Search
R. Zhou and E. A. Hansen (Honeywell Best Student Paper Award)

Phase Transitions in Classical Planning: An Experimental Study*
J. Rintanen

A Polynomial Time Algorithm for Constructing k-Maintainable Policies
C. Baral and T. Eiter

Sunday, June 6

Search in Planning and Scheduling II
Multiple Pattern Databases
R. C. Holte, J. Newton, A. Felner, R. Meshulam, and D. Furcy

A Linear Search Strategy using Bounds
S. Climer and W. Zhang

Optimal Rectangle Packing: New Results
R. E. Korf

A Lookahead Strategy for Heuristic Search Planning
V. Vidal

Scheduling I
Iterative Relaxations for Iterative Flattening in Cumulative Scheduling
L. Michel and P. Van Hentenryck

Generating Robust Schedules through Temporal Flexibility
N. Policella, S. F. Smith, A. Cesta, and A. Oddi

The Value of Consensus in Online Stochastic Scheduling
R. Bent and P. Van Hentenryck

Trading Places: How to Schedule More in a Multi-Resource Oversubscribed Scheduling Problem
L. Barbulescu, A. E. Howe, L. D. Whitley, and M. Roberts

Planning & Scheduling Applications
Plays as Effective Multiagent Plans Enabling Opponent-Adaptive Play Selection
M. Bowling, B. Browning, and M. Veloso

Distributed Feedback Control for Decision Making on Supply Chains
C. Kiekenveld, M. P. Wellman, S. Singh, J. Estelle, Y. Vorobeychik, V. Soni and M. Rudary

Choosing Objectives in Over-Subscription Planning
D. E. Smith

Decision-Theoretic Military Operations Planning
D. Aberdeen, S. Thiébaux, and L. Zhang

Probabilistic Planning
Heuristic Refinements of Approximate Linear Programming for Factored Continuous-State Markov Decision Processes
B. Kveton and M. Hauskrecht

Optimal Resource Allocation and Policy Formulation in Loosely-Coupled Markov Decision Processes
D. A. Dolgov and E. H. Durfee

Policy Generation for Continuous-time Stochastic Domains with Concurrency
H. L.S. Younes, and R. G. Simmons

Monday, June 7

Classical Planning
A Planning Heuristic Based on Causal Graph Analysis
M. Helmert (Honeywell Best Student Paper Award)

An Empirical Analysis of Some Heuristic Features for Local Search in LPG
A. Gerevini, A. Saetti, and I. Serina

Using Component Abstraction for Automatic Generation of Macro-Actions
A. Botea, M. Müller, and J. Schaeffer

Learning Domain-Specific Control Knowledge from Random Walks
A. Fern, S. Yoon, and R. Givan

Scheduling II
Task Swapping for Schedule Improvement: A Broader Analysis
L. A. Kramer and S. F. Smith

Price Prediction Strategies for Market-Based Scheduling
J. K. MacKie-Mason, A. Osepayshvili, D. M. Reeves, and M. P. Wellman

Two-Job Shop Scheduling Problems with Availability Constraints
R. Aggoune

Incremental Maximum Flows for Fast Envelope Computation
N. Muscettola

Model Checking and Plan Recognition
Planning with Extended Goals and Partial Observability
P. Bertoli and M. Pistore

Guiding Planner Backjumping Using Verifier Traces
R. P. Goldman, M. J. S. Pelican, and D. J. Musliner

Probabilistic Plan Recognition in Multiagent Systems
S. Saria and S. Mahadevan

Statistical Goal Parameter Recognition
N. Blaylock and J. Allen

Nondeterministic Planning
Fault Tolerant Planning: Toward Probabilistic Uncertainty Models in Symbolic Non-Deterministic Planning
R. M. Jensen, M. M. Veloso, and R. E. Bryant

Complexity of Planning with Partial Observability
J. Rintanen

Conformant Planning via Heuristic Forward Search: A New Approach
R. I. Brafman and J. Hoffmann (Best Paper Award)

Heuristic Guidance Measures for Conformant Planning
D. Bryce and S. Kambhampati
ICAPS Invited Talks

Saturday, June 5, 9:00 – 10:00 AM
“Advanced Research with Autonomous Unmanned Aerial Vehicles”
Patrick Doherty, Linköping University, Sweden

Sunday, June 6, 10:30 – 11:30 AM
“Artificial Intelligence Meets Operations Research: A Constraint Programmer’s Point of View”
Michela Milano, Università di Bologna, Italy

Monday, June 7, 10:30 – 11:30 AM
“Planning for an Uncertain Future”
Reid Simmons, Carnegie Mellon University, USA

ICAPS Best Paper Awards

Best Paper Award: “Conformant Planning via Heuristic Forward Search: A New Approach”
Ronen Brafman and Jörg Hoffmann

Runner-up for Best Paper Award: “Multiple Pattern Databases”
Robert Holte, Jack Newton, Ariel Felner, Ram Meshulam, and David Furcy

Honeywell Best Student Paper Award: “A Planning Heuristic Based on Causal Graph Analysis”
Malte Helmert

Honeywell Best Student Paper Award: “Breadth-First Heuristic Search”
Rong Zhou and Eric Hansen

Runner-up for Honeywell Best Student Paper Award: “Trading Places: How to Schedule More in a Multi-Resource Oversubscribed Scheduling Problem”
Laura Barbulescu, Adele Howe, Darrell Whitley, and Mark Roberts

ICAPS Sponsors

Computational Sciences Division at NASA Ames Research Center

Research Institute for Advanced Computer Science

Intelligent Systems Project, NASA

NASA – Jet Propulsion Laboratory

National Science Foundation

The Air Force Office of Scientific Research

Defense R&D Canada

National ICT Australia

Honeywell
Honeywell

American Association for Artificial Intelligence
General Information

Headquarters Hotel
The Westin Resort & Spa Whistler
4090 Whistler Way
Whistler, BC, Canada
Phone: (604) 905-5000

Conference Venue
All ICAPS meetings will take place at the Whistler Conference Centre except for the ICAPS/KR Festival, which will take place at the Westin Resort & Spa.

Registration
The registration desk will be located on the Conference Level Foyer of the Westin Resort & Spa. Registration Desk Hours:
- Wednesday, June 2: 8:00 AM – 5:00 PM
- Thursday, June 3: 8:00 AM – 5:00 PM
- Friday, June 4: 8:30 AM – 5:00 PM
- Saturday, June 5: 8:30 AM – 5:00 PM
- Sunday, June 6: 8:00 AM – 5:00 PM
- Monday, June 7: 8:00 AM – 12:00 PM

ICAPS Doctoral Consortium Lunch
Friday, June 4, 12:30 – 2:00 PM
Harmony A (Whistler Conference Centre)
(By invitation only)

ICAPS Executive Council Meeting
Friday, June 4, 8:00 PM
Fitzsimmons Room (Whistler Conference Centre)
(By invitation only)

ICAPS/KR Festival
Saturday, June 5, 6:00 – 8:00 PM
Emerald AB (Westin Resort & Spa)
(Free with registration)

ICAPS Organizing Committee Lunch
Sunday, June 6, 12:50 – 2:00 PM
Mountain View (Whistler Conference Center)
(By invitation only)

ICAPS Banquet
Sunday, June 6, 7:00 PM
Araxi Restaurant.
4222 Village Square, Whistler.
Phone: (604) 932-4540
(Ticket required)
Banquet tickets will be available for purchase during registration hours (US$65) prior to the lunch break on Friday, June 4. Banquet tickets will NOT be available for sale at the restaurant.

Internet Room
Internet service will be available in Glacier B at the Westin Resort & Spa during registration hours.

Wireless Internet Service
Wireless Internet access cards are available at the registration desk during registration hours for $5.00. The cards are valid between June 2-8. If you did not reserve a card ahead of time, the supply is limited on a first-come, first-served basis.

Poster Setup Time
Participants in the Doctoral Consortium will be able to set up their posters from 12:00 – 4:00 PM on Saturday, June 5.

Tickets
Each ICAPS 2004 registrant will receive tickets with the registration materials for one copy of the conference proceedings and one copy of the International Planning Competition Notes. Tutorial and workshop registrants will receive tickets for copies of the appropriate workshop(s) and/or tutorial(s) material. Tickets can be redeemed at the Glacier Room of the Westin Resort & Spa during registration hours.

Material for Purchase
Additional copies of conference proceedings, tutorial syllabi, workshop notes, International Planning Competition notes as well as ICAPS t-shirts and bags will be available for purchase at the registration desk during registration hours. Supplies are limited.

Room Rates & GST
The Conference special rate is $139.00 CAD ($131.00 + $8.00 Resort Fee) for Studio Junior Suites and $179.00 CAD ($171.00 + $8.00 Resort Fee) for One Bedroom Suites plus applicable taxes. Please note that the above rates are INCLUSIVE of a Resort Fee and DISREGARD the confirmation letter stating that there is an additional Resort Fee charge of $20.00. Note also that non-residents of Canada are eligible to reclaim the GST for hotel rooms at the border when they leave the country. The Westin Resort & Spa may be able to directly rebate the GST on its invoices.
The Upper Level of the Whistler Conference Centre
Highlights

1. The Westin Resort & Spa
6. Whistler Conference Centre
X. Araxi Restaurant