ICAPS-07 Timetable

	Ballroom D	Ballroom E	Room 552A-B
		Monday, September 24	
8:50 - 9:00			ICAPS-07 Welcome
9:00 - 10:00			Invited Talk Markus Fromherz
10:00 - 10:30		Tea Break	
10:30 - 12:15		Technical Session Uncertainty I 3 papers (47,75,59)+ 3 spotlights (57,43,76)+ commentaries	Technical Session Time & Resources 3 papers (161,163,52)+ 3 spotlights (11,171,181)+ commentaries
12:15 - 14:00		Lunch Break	
14:00 - 15:40		Technical Session Uncertainty II 3 papers (114,146,139)+ 3 spotlights (107,153,54) + commentaries	Technical Session Abstraction & Structure 3 papers (71,39,133)+ 3 spotlights (182,175,64)+ commentaries
15:40 - 16:10		Tea Break	
16:10 - 17:20		Technical Session On-line Pl., Execution 2 papers (60,94)+ 2 spotlights (100,93)+ commentaries	Technical Session Search I 2 papers (140,183)+ 1 spotlight (42)+ commentaries
17:30-19:00			ICKEPS (30mn) Awards (20mn) PhD Award Talks (40mn)
		Tuesday, September 25	
9:00 - 10:00	Invited Talk Joint ICAPS-CP Matt Ginsberg		
10:00 - 10:30		Tea Break	
10:30 - 12:30	Technical Session Joint ICAPS-CP 4 papers (CP137,155,73,CP147)		
12:30 - 14:00		Lunch Break	
14:00 - 15:30		Technical Session Planning Formalisms 3 papers (82,85,33)+ commentaries	Technical Session Learning 3 papers (88,21,37)+ commentaries
15:30 - 16:00		Tea Break	
16:00 - 18:00			Business Meeting (30mn) Festivus (90mn)
19:00 - 00:00		Banquet	
		Wednesday, September 26	
9:00 - 10:00	Invited Talk Joint ICAPS-CP Sheila McIlraith		
10:00 - 10:30		Tea Break and Poster Set-Up	
10:30 - 12:30		Poster/Demo Session demos DC posters regular posters	
12:30 - 14:00		Lunch Break	
14:00 - 15:30		Technical Session Search II 3 papers (65,97,183) + commentaries	Technical Session Systems & Applications 3 papers (98,151,90)+ commentaries
15:30		End	

Monday, September 24

Welcome Room 552 A-B

9:00-10:00

Invited Talk Room 552 A-B, Chair Brian Williams

> Integrated Model-based Planning and Control for Highly Reconfigurable Systems.
> Markus Fromherz.

10:30-12:15

Uncertainty I Ballroom E, Chair Eric Hansen

47 (paper) Using Adaptive Priority Weighting to Direct Search in Probabilistic Scheduling.
Andrew Sutton, Adele Howe, Darrell Wheetley.

75 (paper) A Fast Incremental Algorithm for Maintaining Dispatchability of Partially Controllable Plans.
Julie Shah, John Stedl, Brian Williams, Paul Robertson.

59 (paper) Concurrent Probabilistic Temporal Planning with Policy-Gradients.
Douglas Aberdeen, Olivier Buffet.

57 (spotlight) Robust Local Search and Its Application to Generating Robust Schedules.
Hoong Chuin Lau, Thomas Ou, Fei Xiao.

43 (spotlight) Generating Exponentially Smaller POMDP Models Using Conditionally Irrelevant Variable Abstraction.
Trey Smith, David R. Thompson, David S. Wettergreen.

76 (spotlight) Mixed integer linear programming for exact finite-horizon planning in decentralized POMDPs.
Raghav Aras, Alain Dutech, François Charpillet.

Time & Resources Room 552 A-B, Chair Patrik Haslum

161 (paper) Online Planning for Resource Production in Real-Time Strategy Games.
Hei Chan, Alan Fern, Soumya Ray, Nick Wilson, Chris Ventura.

163 (paper) Evaluating Temporal Planning Domains.
William Cushing, Daniel Weld, Subbarao Kambhampati, Mausam, Kartik Talamadupula.

52 (paper) Complexity of Concurrent Temporal Planning.
Jussi Rintanen.

11 (spotlight) Managing Personal Tasks with Time Constraints and Preferences.
Ioannis Refanidis.

171 (spotlight) Bounding the Resource Availability of Activities with Linear Resource Impact.
Jeremy Frank, Paul Morris.

181 (spotlight) Planning with Respect to an Existing Schedule of Events.
Andrew Coles, Maria Fox, Derek Long, Amanda Smith.

14:00-15:40

Uncertainty II Ballroom E, Chair Dan Weld

114 (paper) External Memory Value Iteration.
Stefan Edelkamp, Shahid Jabbar, Blai Bonet.

139 (paper) FF-Replan: A Baseline for Probabilistic Planning.
Sungwook Yoon, Alan Fern, Bob Givan.

146 (paper) From Conformant into Classical Planning: Efficient Translations That May be Complete Too.
Hector Palacios, Hector Geffner.

107 (spotlight) Prioritizing Bellman Backups Without a Priority Queue.
Peng Dai, Eric Hansen.

153 (spotlight) FF+FPG: Guiding a Policy-Gradient Planner.
Olivier Buffet, Douglas Aberdeen.

54 (spotlight) Approximate Solution Techniques for Factored First-order MDPs.
Scott Sanner, Craig Boutilier.

Abstraction & Structure <u>Room 552 A-B, Chair Craig Knoblock</u>

71 (paper) Flexible abstraction heuristics for optimal sequential planning.
Malte Helmert, Patrik Haslum, Jörg Hoffmann.

39 (paper) Act Local, Think Global: Width Notions for Tractable Planning.
Hubie Chen, Omer Gimenez.

133 (paper) Semantics for High-level Actions.
Bhaskara Marthi, Jason Wolfe, Stuart Russell.

182 (spotlight) Online Identification of Useful Macro-Actions for Planning.
Andrew Coles, Maria Fox, Amanda Smith.

175 (spotlight) On the Hardness of Planning Problems With Simple Causal Graphs.
Anders Jonsson, Omer Gimenez.

64 (spotlight) Structural Patterns of Tractable Sequentially-Optimal Planning.
Michael Katz, Carmel Domshlak.

<u>16:10-17:20</u>

On-line planning and Execution <u>Ballroom E, Chair Sven Koenig</u>

60 (paper) Transformational Planning for Everyday Activity.
Armin Müller, Alexandra Kirsch, Michael Beetz.

94 (paper) Monitoring Plan Optimality During Execution.
Christian Fritz, Sheila McIlraith.

100 (spotlight) Planning with Diversified Models for Fault-Tolerant Robots.
Benjamin Lussier, Matthieu Gallien, Jérémie Guiochet, Félix Ingrand, Marc-Olivier Killijian, David Powell.

93 (spotlight) Dynamic Control in Path-Planning with Real-Time Heuristic Search.
Vadim Bulitko, Yngvi Bjornsson, Mitja Lustrek, Jonathan Schaeffer, Sverrir Sigmundarson.

Search I <u>Room 552 A-B, Chair Jörg Hoffmann</u>

140 (paper) A Hybrid Linear Programming and Relaxed Plan Heuristic for Partial Satisfaction Planning Problems.
J. Benton, Menkes van den Briel, Subbarao Kambhampati.

183 (paper) A New Local-Search Algorithm for Forward-Chaining Planning.
Andrew Coles, Maria Fox, Amanda Smith.

42 (spotlight) Using Decision Procedures Efficiently for Optimization.
Matthew Streeter, Stephen Smith.

<u>17:30-19:00</u>

ICKEPS and Awards <u>Room 552 A-B, Chair Sylvie Thiébaux</u>

The International Competition on Knowledge Engineering for Planning & Scheduling
Stefan Edelkamp and Jeremy Frank

Awards:

- ICAPS-07 Doctoral Consortium Best Papers
- ICAPS-07 Best Papers
- 2007 ICAPS Influential Papers
- 2007 ICAPS Outstanding Dissertations

Outstanding Dissertation Presentations:

- Complexity Analysis and Optimal Algorithms for Decentralized Decision Making. Daniel Bernstein.
- Admissible Heuristics for Automated Planning. Patrik Haslum.
- Solving Planning Tasks in Theory and Practice. Malte Helmert.
- Verification and Planning for Stochastic Processes with Asynchronous Events. Håkan Younes.

Tuesday, September 25

Invited Talk Ballroom D, Chair TBA

> Of Mousetraps and Men: A Cautionary Tale.
> Matt Ginsberg

Joint ICAPS-CP Session Ballroom D, Chair Chris Beck

CP137 (paper) An LP-Based Heuristic for Optimal Planning.
Menkes van der Briel, J. Benton, Subbarao Kambhampati, Thomas Vossen.

155 (paper) Constructing Conflict-Free Schedules in Space and Time.
David Hildum, Stephen Smith.

73 (paper) The Manpower Allocation Problem with Time Windows and Job-Teaming Constraints.
Anders Dohn, Esben Kolind, Jens Clausen.

CP147 (paper) Scheduling Conditional Task Graphs.
Michele Lombardi, Michela Milano.

Planning Formalisms Ballroom E, Chair David Smith

82 (paper) Temporally-expressive planning as constraint satisfaction problems.
Yuxiao Hu.

85 (paper) Exploiting Procedural Domain Control Knowledge in State-of-the-Art Planners.
Jorge Baier, Christian Fritz, Sheila McIlraith.

33 (paper) Planning Robust Temporal Plans: a Comparison Between CBTP and TGA Approaches.
Yasmina Abdedïm, Eugene Asarin, Matthieu Gallien, Felix Ingrand, Charles Lesire, Mihaela Sighire-anu.

Learning Room 552 A-B, Chair Alan Fern

88 (paper) Learning to Plan using Harmonic Analysis of Diffusion Models.
Sridhar Mahadevan, Sarah Osentoski, Jeff Johns, Kimberly Ferguson, Chang Wang.

21 (paper) Gradient-Based Relational Reinforcement-Learning of Temporally Extended Policies.
Charles Gretton.

37 (paper) Discovering relational domain features for probabilistic planning.
Jia-Hong Wu, Bob Givan.

Business Meeting + Festivus Room 552 A-B, Chair Maria Fox

- Business Meeting
- Festivus: Help! Our Hard Problems are Missing
  Speakers:Fahiem Bacchus, Jeremy Frank, Hector Geffner and Subbarao Kambhmapati.

Wednesday, September 26

Invited Talk Ballroom D, Chair Mark Boddy

> Automated Web Service Composition: New (and not so new) challenges for AI planning
> Sheila McIlraith

Posters and Demonstrations Ballroom E, Room 552 A-B

 Demonstrations (Ballroom E)

- MEXAR2: a Software Tool for Continuous Support to Data Dumping Activities for MARS EXPRESS
  Amedeo Cesta, Gabriella Cortellessa, Simone Fratini, Angelo Oddi, Nicola Policella.

- Demonstrating Automated Planning and Scheduling for Orbital Express
  Caroline Chouinard, Russel Knight, Grailing Jones, Daniel Tran.

- A Planning and Scheduling System to allocate ESA Ground Station Network Services.
  Sylvain Damiani, Holger Dreihahn, Jörg Noll, Marc Niézette, Gian Paolo Calzolari.

- University Course Timetabling & Student Sectioning System.
  Tomas Müller, Keith Murray, Stephanie Schluttenhofer.

- SELFPLANNER: An Intelligent Web-based Calendar Application
  Ioannis Refanidis, Anastasios Alexiadis

- Traplas, a Transport Planning Simulator
  Jonne Zutt, Willem Drost, Herbert de Vos.

 Main conference posters (Ballroom E)

- Mixed integer linear programming for exact finite-horizon planning in decentralized POMDPs.
  Raghav Aras, Alain Dutech, François Charpillet.

- FF+FPG: Guiding a Policy-Gradient Planner.
  Olivier Buffet, Douglas Aberdeen.

- Dynamic Control in Path-Planning with Real-Time Heuristic Search.
  Vadim Bulitko, Yngvi Bjornsson, Mitja Lustrek, Jonathan Schaeffer, Sverrir Sigmundarson.

- Planning with Respect to an Existing Schedule of Events.
  Andrew Coles, Maria Fox, Derek Long, Amanda Smith.

- Online Identification of Useful Macro-Actions for Planning.
  Andrew Coles, Maria Fox, Amanda Smith.

- Prioritizing Bellman Backups Without a Priority Queue.
  Peng Dai, Eric Hansen.

- Bounding the Resource Availability of Activities with Linear Resource Impact.
  Jeremy Frank, Paul Morris.

- On the Hardness of Planning Problems With Simple Causal Graphs.
  Anders Jonsson, Omer Gimenez.

- Structural Patterns of Tractable Sequentially-Optimal Planning.
  Michael Katz, Carmel Domshlak.

- Robust Local Search and Its Application to Generating Robust Schedules.
  Hoong Chuin Lau, Thomas Ou, Fei Xiao.

- Planning with Diversified Models for Fault-Tolerant Robots.
  Benjamin Lussier, Matthieu Gallien, Jérémie Guiochet, Félix Ingrand, Marc-Olivier Killijian, David Powell.

- Managing Personal Tasks with Time Constraints and Preferences.
  Ioannis Refanidis.

- Approximate Solution Techniques for Factored First-order MDPs.
  Scott Sanner, Craig Boutilier.

- Generating Exponentially Smaller POMDP Models Using Conditionally Irrelevant Variable Abstraction.
  Trey Smith, David R. Thompson, David S. Wettergreen.

- Using Decision Procedures Efficiently for Optimization.
  Matthew Streeter, Stephen Smith.

 Doctoral consortium posters (Room 552 A-B)

- Planning with Contingencies via a Fast and Informed Action Selection Mechanism. Alexandre Albore.

- Constraint Directed Variable Neighbourhood Search. Alastair Andrew.

- Domain Control Knowledge and State-of-the-Art Planners. Jorge A. Baier.
- A Hybrid Linear Programming and Relaxed Plan Heuristic for Partial Satisfaction Planning Problems. J. Benton.
- Research in Concurrent Planning. William Cushing.
- Faster Dynamic Programming for MDPs. Peng Dai.
- Optimizing the Slab Yard Crane Scheduling Problem. Anders Dohn.
- Combining Automated Planning and Hybrid Control: a Quadruped Bouncing Gait. Robert Effinger.
- Monitoring the Execution of Optimal Plans. Christian Fritz.
- Discrepancy-Based Method for Distributed Supply Chain Operations Planning. Jonathan Gaudreault.
- From Task Definitions and Plan Traces to HTN Methods. Chad Hogg.
- Learning Action Success Patterns from Execution. Sergio Jimenez.
- Towards Structural-Patterns Admissible Heuristics. Michael Katz.
- Set-Additive and TSP Heuristics for Planning with Action Costs and Soft Goals. Emil Keyder.
- Symbolic Exploration for General Game Playing in PDDL. Peter Kissmann.
- Local Search for Grid Scheduling. Dalibor Klusacek.
- Robustness in Context-Aware Route Planning. Adrian ter Mors.
- Planning for Automatic Video Processing Using Ontology-Based Workflow. Gayathri Nadarajan.
- The Cyclic Sequence Constraint. Nina Narodytska.
- Wizard: Suggesting Macro-Actions Comprehensively. Hakim Newton.
- From Conformant into Classical Planning: Efficient Translations that May Be Complete Too. Hector Palacios.
- Preliminary Results for Approximate Temporal Coordination under Uncertainty. Emmanuel Rachelson.
- Traffic Light Scheduling Using Policy-Gradient Reinforcement Learning. Silvia Richter.
- Harnessing Algorithm Bias in Classical Planning. Mark Roberts.
- Case-based Search Control for Heuristic Planning. Tomas de la Rosa.
- Using Abstraction for Generalized Planning. Siddharth Srivastava.
- Using Decision Procedures Efficiently for Optimization. Matthew Streeter.
- Analysis of Search Landscape Neutrality in Scheduling Problems. Andrew Sutton.
- Autonomous Inter-Task Transfer in Reinforcement Learning Domains. Mathew Taylor.
- Discovering and Applying Domain Features in Probabilistic Planning. Jia-Hong Wu.
- Fault Detection and Recovery in Multi-Modal Transportation Networks. Jonne Zutt.

14:00-15:30

Search II Ballroom E, Chair Malte Helmert

65 (paper) Cost-Sharing Approximations for h+
Vitaly Mirkis, Carmel Domshlak.

97 (paper) Context-aware logistic routing and scheduling.
Jonne Zutt, Adriaan ter Mors, Cees Witteveen.

183 (paper) Learning Macro-Actions for Arbitrary Planners and Domains.
M.A. Hakim Newton, John Levine, Maria Fox, Derek Long.

Systems and Applications Room 552 A-B, Chair Karen Myers

98 (paper) Towards a Heuristic for Scheduling the James Webb Space Telescope.
Mark Giuliano, Reiko Rager, Nazma Ferdous.

151 (paper) An innovative product for space mission planning: an a posteriori evaluation.
Amedeo Cesta, Gabriella Cortellessa, Simone Fratini, Angelo Oddi, Nicola Policella.

90 (paper) itSIMPLE 2.0: An Integrated Tool for Designing Planning Domains.
Tiago Vaquero, Victor Romero, Flavio Tonidandel, José Reinaldo Silva.

Invited Speakers

Markus Fromherz *Integrated Model-based Planning and Control for Highly Reconfigurable Systems*

Monday September 24, 9:00-10:00, Room 552 A-B

Abstract: Embedded computing, sensing, and actuation keep getting cheaper, creating new applications for embedded software technologies. One particular opportunity is to modularize products - to build reconfigurable systems from simpler but smarter components. There is much promise in the use of intelligent software technologies for such systems, in particular in model-based approaches to planning and control. Current techniques, however, must address a number of challenges before they can be applied in reconfigurable real-time systems. For planning, these challenges include compositional modeling, on-line planning and exception handling, real-time planner control, and the interaction with low-level control. This talk will discuss challenges, solutions, and lessons learned in the context of a long-term project at PARC to bring such techniques to highly reconfigurable printing systems.

Biography: Markus Fromherz is director of the Intelligent Systems Laboratory at the Palo Alto Research Center (PARC), as well as a PARC Principal Scientist. The laboratory's focus is on advanced reasoning and interaction technologies that help people to perceive, reason, and interact in the physical and virtual worlds we live in. The laboratory performs research and development in cognitive science, user interfaces, image content extraction, natural language processing, and intelligent reasoning for embedded systems. Fromherz joined PARC in 1992. His research interests are in the domain of intelligent embedded software, in particular constraint-based modeling, model-based planning, scheduling, and control, and model-based design analysis and optimization. He has led and contributed to several research, development, and technology transfer efforts on intelligent control systems for Xerox. Fromherz received his Ph.D. in Computer Science in 1991 from the University of Zurich (Switzerland) and his M.S. in Computer Science in 1987 from ETH Zurich.

Matthew L. Ginsberg *Of Mousetraps and Men: A Cautionary Tale*

Tuesday September 25, 9:00-10:00, Ballroom E

Abstract: This talk consists of two interwoven stories. The Happy Story presents a technical solution to the problem of optimizing for cost instead of the more normal metric of duration. We describe a mechanism whereby the optimization problem is split into an evaluation component, where the projected cost of a schedule is evaluated using dynamic programming techniques, and a search component, where search is conducted in "window space" to find a cost-efficient schedule. The Sad Story explains what happens when you build a better mousetrap. The people beating a path to your door are the fat cats, who are reimbursed for their mouse catching on a cost-plus basis.

Biography: Matthew L. Ginsberg received his doctorate in mathematics from Oxford in 1980 at the age of 24. He remained on the faculty in Oxford until 1983, doing research in mathematical physics and computer science; during this period, he wrote a program that was used successfully to trade stock and stock options on Wall Street. Ginsberg's continuing interest in artificial intelligence brought him to Stanford in late 1983, where he remained for nine years. He then went on to found CIRL, the computational intelligence research laboratory at the University of Oregon, which he directed until 1996. He remained at CIRL until 1998, when CIRL spun off On Time Systems, a commercial entity focusing on scheduling and routing technology. Ginsberg has been the CEO of the company since its formation.Ginsberg's present research interests include constraint satisfaction and scheduling. He is the author of numerous publications in these areas, the editor of "Readings in Nonmonotonic Reasoning," and the author of "Essentials of Artificial Intelligence," both published by Morgan Kaufmann. He is also the author of the bridge-playing program GIB, which made international news by finishing 12th in the world bridge championships in Lille, France.

Sheila McIlraith *Automated Web Service Composition: New (and not so new) challenges for planning*

Wednesday September 26, 9:00-10:00, Ballroom E

Abstract: Imagine a planning problem with tens of thousands of actions. Unlike classical planning operators, these actions are more akin to small, potentially nondeterministic, programs and are selected based on the optimization of nonfunctional properties, as well as on their preconditions and effects. The intial state of this planning problem is incomplete. Further the goal is not a final state goal, but rather one that talks about properties over the evolution of the plan. Some of these goals must be achieved, others are merely statements of preference. This planning problem, and the many challenges it presents, is typical of the task of automated web service composition, and more generally automated composition of business processes. In this talk we use the task of web service composition to motivate a set of challenges to AI planning (some old and some new) and present recent progress in addressing some of these challenges.

biography: Sheila McIlraith is an Associate Professor in the Department of Computer Science, University of Toronto. Prior to joining the university in 2004, McIlraith spent six years as a Research Scientist at Stanford University, and one year at Xerox PARC. McIlraith's research is in the areas of knowledge representation and automated reasoning, particularly as they relate to reasoning about dynamical systems. She has made contributions in the areas of automated web service composition, planning with preferences and temporally extended goals, logical reasoning, and diagnostic problem solving. McIlraith is an associate editor of the journal Artificial Intelligence, past editorial board member of JAIR, and past program co-chair of the International Semantic Web Conference.

Awards

ICAPS 2007 Best Research Paper Award

Flexible abstraction heuristics for optimal sequential planning.
Malte Helmert, Patrik Haslum, and Joerg Hoffmann.

ICAPS 2007 Best Application Paper Award

An innovative product for space mission planning: an a posteriori evaluation.
Amedeo Cesta, Gabriella Cortellessa, Simone Fratini, Angelo Oddi, and Nicola Policella.

ICAPS 2007 Best Student Paper Award

From Conformant into Classical Planning: Efficient Translations That May be Complete Too.
Hector Palacios and Hector Geffner.

ICAPS 2007 Best Doctoral Consortium Papers

Award: Monitoring the Execution of Optimal Plans.
Christian Fritz.

Runner Up: Using Decision Procedures Efficiently for Optimization.
Matthew Streeter.

ICAPS 2007 Influential Papers

Award: Conditional Nonlinear Planning.
Mark Peot and David E. Smith.
Proc. AIPS-92

Mention: Using Temporal Logic to Control Search in a Forward Chaining Planner.
Fahiem Bacchus and Froduald Kabanza.
Proc. ECP-95

ICAPS 2007 Outstanding Dissertations

Award: *Håkan Younes* - for his creative research on formal verification of discrete event systems and planning with concurrent actions with uncertain duration, for the development of an original representation based on Semi-Markov Decision Processes and of a highly innovative algorithmic approach for solving this class of planning problems.

Mention: *Daniel Bernstein* - for is highly innovative research on planning under uncertainty for multiple agents introducing and characterizing a new framework of decentralized MDPs.

Mention: *Patrik Haslum* - for his marked contribution to the development of a family of admissible heuristics for optimal planning in the sequential and temporal settings.

Mention: *Malte Helmert* - for his extensive work on the analysis and characterization of the structure of classical planning domains and his highly effective heuristics using abstraction hierarchies derived from causal graphs.