Preface

This volume contains the papers accepted for presentation at ICAPS 2007, the Seventeenth International Conference on Automated Planning and Scheduling. The annual ICAPS conference series was formed in 2003 through the merger of two pre-existing biennial conferences, the International Conference on Artificial Intelligence Planning Systems (AIPS) and the European Conference on Planning (ECP). ICAPS continues the traditional high standards of AIPS and ECP as an archival forum for new research in the field of automated planning and scheduling.

In 2007 ICAPS is collocated with the Constraint Programming conference (CP). The intention behind this collocation is to encourage communication between the two communities, build on existing collaborations, and encourage the development of new opportunities for the cross-fertilization of ideas.

This volume includes all papers selected for plenary and poster presentation at ICAPS 2007. This year, the distinction between plenary and poster papers was based, not on the quality of the paper, but on whether it was considered to be of broad, or more focused, interest. The 45 accepted papers were selected from a total of 136 submissions. All submissions were rigorously reviewed by an international program committee, managed by a senior program committee. The senior program committee consisted of the three cochairs and an additional member, John Bresina, whose role was to handle chairs' papers. We thank John for performing this role.

The papers present the latest advances in the field of automated planning and scheduling, ranging in scope from theoretical analyses of planning and scheduling problems and processes, to new algorithms for planning and scheduling under various constraints and assumptions, to empirical evaluation of planning and scheduling techniques in practical applications. They reflect recent research trends in the field toward the use of search and constraint reasoning in planning and scheduling; probabilistic planning models and algorithms; integrated frameworks for planning, scheduling, and execution; learning in planning and scheduling; and mixed-initiative systems. For this conference we recruited ambassadors, in the fields of machine learning (Peter Stone) and model-based reasoning (Brian Williams), to help to strengthen links between planning and scheduling and these related areas.

In addition to the technical program, the ICAPS 2007 conference program also includes a number of satellite events. A series of 5 half-day tutorials precede the start of the technical program on September 24th: "Fuzzy Temporal Reasoning," "Approximation Based Reasoning and Conformant Planning: Bridging Reasoning About Actions and Changes (RAC) and Planning," "Probabilistic Temporal Planning," "Advances in Solving Combinatorial Optimization Tasks Over Graphical Models" and "Learning Techniques in Planning." We thank the tutorial program cochairs, John Bresina and Brent Venable, for putting together an exciting set of tutorials in challenging new areas.

A set of eight workshops take place over September 22nd and 23rd: "AI Planning and Learning," "Heuristics for Domain-independent Planning: Progress, Ideas, Limitations, Challenges," "Planning and Plan Execution for Real-World Systems: Principles and Practices for Planning in Execution," "Scheduling a Scheduling Competition," "Constraint Satisfaction Techniques for Planning and Scheduling Problems," "International Planning Competition: Past, Present and Future," "Moving Planning and Scheduling Systems into the Real World," and "Planning and Games." We thank our workshop program cochairs, Philippe Laborie and Dan Weld, for their organizational efforts.

There will be three invited talks for which we thank our invited speakers: Markus Fromherz, Matt Ginsberg, and Sheila McIlraith.

Following the tradition of recent ICAPS conferences, a doctoral consortium has been organized,

providing Ph.D. students in the field of automated planning and scheduling with the opportunity to present their current research in both a full-day workshop event and a poster session during the conference. These two events will enable students to receive early feedback from experts in the field. The 2007 ICAPS Doctoral Consortium was organized by Joerg Hoffmann and Jean-Paul Watson, and we thank them for this important service to the young researchers in our field.

This year the Second International Knowledge Engineering for Planning Competition (IKEPS) will be held in conjunction with the conference. This is an opportunity to compare and exhibit technologies for the representation of planning domains, using both automated and mixed-initiative techniques. The exhibition takes place on the morning of the first day, September 22nd. We thank Stefan Edelkamp and Jeremy Frank for their efforts in arranging this event.

This year also sees the continuation of the system demonstrations event, with seven entrants. We thank Rune Jensen and Froduald Kabanza for organizing this event.

A further tradition that we uphold this year is the Festivus, launched by Rao Kambhampati at ICAPS in 2005. This year the topic of the debate is "Help! Our hard problems are missing!"

We also thank the other members of the Organizing Committee: Meinolf Sellmann (local arrangements); Adi Botea, Berthe Choueiry, and Alessandro Cimatti (publicity); Mark Drummond, Barry Fox, and Toby Walsh (sponsorship); and Fahiem Bacchus (CP liaison). Without their efforts this conference would not have happened.

Finally, we thank our sponsors: the Australian National University, the University of New South Wales at the Australian Defence Force Academy (UNSW@ADFA), the Association for the Advancement of Artificial Intelligence (AAAI), ICAPS Inc., the National Science Foundation, SRI International, Semantic Technology Institutes International, National ICT Australia, Honeywell, David E. Smith, NASA, and the University of Canberra.

This year ICAPS introduced two new awards: the ICAPS Influential Paper Award, which honors a significant and influential paper published at least ten years earlier in a planning and scheduling conference, and the ICAPS Best Dissertation Award, which honors an outstanding PhD thesis in any area of automated planning and scheduling. The ICAPS awards committee selected the following winners for 2007.

The ICAPS Influential Paper Award was granted to Mark Peot and David Smith for their paper "Conditional Non-linear Planning," published in the *Proceedings of the International Conference on Artificial Intelligence Planning Systems* (AIPS) in 1992.

An Honorable Mention was awarded to Fahiem Bacchus and Froduald Kabanza for their paper "Using Temporal Logic to Control Search in a Forward Chaining Planner," published in the *Proceedings of the European Conference on Planning (ECP)* in 1995.

The ICAPS Best Dissertation Award for 2007 was granted to Håken Younes for his thesis entitled "Verification and Planning for Stochastic Processes with Asynchronous Events." The awards committee noted his creative research on formal verification of discrete event systems and planning with concurrent actions with uncertain duration, his 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.

The Honorable Mention of "Outstanding Dissertation in Automated Planning and Scheduling" for 2007 was additionally awarded to the following persons:

- Daniel Bernstein for his highly innovative research on planning under uncertainty for multiple agents introducing and characterizing a new framework of decentralized MDPs
- Patrick Haslum for his marked contribution to the development of a family of admissible heuristics for optimal planning in the sequential and temporal settings

- 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.

The ICAPS 2007 Conference cochairs granted the Best Research Paper award to Malte Helmert, Patrik Haslum and Jörg Hoffmann for their paper "Flexible Abstraction Heuristics for Optimal Sequential Planning."

The Best Application Paper award was granted to Amedeo Cesta, Gabriella Cortellessa, Simone Fratini, Angelo Oddi, Nicola Policella for their paper "An Innovative Product for Space Mission Planning: an a posteriori Evaluation."

Finally, the Best Student Paper award was made to Hector Palacios and Hector Geffner for their paper "From Conformant into Classical Planning: Efficient Translations That May be Complete Too."

— Mark Boddy, Maria Fox, and Sylvie Thiébaux
Conference Chairs