Preface

This volume contains the papers accepted for presentation at ICAPS 2012, the Twenty-Second International Conference on Automated Planning and Scheduling, to be held in Atibaia, São Paulo, Brazil, June 25–29, 2012. 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 and Scheduling (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.

The 45 papers included in this volume, consisting of 37 long papers and 8 short papers, are those selected for plenary presentation at ICAPS 2012 from a total of 132 submissions. All submissions were rigorously reviewed by the Program Committee, and this set of accepted papers reflects the Program Committee's high reviewing standards.

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 particular in the subareas of optimal planning, probabilistic and non-deterministic planning, planning and scheduling for transportation, robot path planning, and new developments in heuristics for planning algorithms. Applications that are considered span such diverse areas as planning and scheduling for ships, route planning for bicycles, machine tool calibration and planning of oil pipeline networks.

From this excellent collection of papers, three were selected for special recognition. "Semi-Relaxed Plan Heuristics" by Emil Keyder, Jörg Hoffmann and Patrik Haslum was selected for the Best Paper Award. The two papers "Temporal Planning with Preferences and Time-Dependent Continuous Costs" by J. Benton, Amanda Coles and Andrew Coles and "On Computing Conformant Plans Using Classical Planners: A Generate-And-Complete Approach" by Khoi Nguyen, Vien Tran, Tran Cao Son and Enrico Pontelli were selected for Best Student Paper Award.

In addition to the oral presentation of these papers, the technical program of this year's ICAPS conference includes invited talks by three distinguished speakers: Robert O. Ambrose (Controlling Robots Across Intermediate Time Delays), Anthony G. Cohn (Building Qualitative Models of Spatio-Temporal Behaviour), and George J. Pappas (Temporal Logic Motion Planning for Mobile Robots).

This year, the ICAPS conference introduced a special track on continuous planning. This multidisciplinary track focused on all elements of online systems that perform real-time planning, execution, monitoring, and adaptation. Topics included real-time planning, planning in mixed discrete-continuous domains, planning for systems with hidden state, plan monitoring and diagnosis of discrete and continuous systems. Papers were encouraged from a range of neighboring disciplines, including model-based reasoning, hybrid systems, run-time verification, control and robotics. The track had a separate program committee that drew upon these disciplines. Tutorials and invited talks were selected that support the themes of this track.

The ICAPS 2012 Conference Program also includes two days of satellite events, including 7

workshops, 6 tutorials, a doctoral consortium, and a systems demonstration event. The workshops this year are Combining Task and Motion Planning for Real-World Applications, Constraint Satisfaction Techniques for Planning and Scheduling Problems, Heuristics and Search for Domain Independent Planning, International Planning Competition, Planning and Plan Execution for Real-World Systems: Principles and Practices for Planning in Execution, Planning and Scheduling with Timelines, and Scheduling and Planning Applications.

The tutorials offer in-depth perspectives on the following topics: hybrid systems, model-based diagnosis, discrete and continuous planning domain modeling, decision diagrams in discrete and continuous planning, and basic and advanced heuristic search. Following the tradition of recent ICAPS conferences, a Doctoral Consortium was once again organized, providing Ph.D. students in the field of automated planning and scheduling with the opportunity to present their current research during the conference and receive early feedback from experts in the field. To further support student researchers in automated planning and scheduling, a Planning and Scheduling School has been organized to take place immediately before the ICAPS Conference, June 22–23.

Also associated with this year's conference is the Fourth International Knowledge Engineering for Planning and Scheduling Competition (ICKEPS). This competition started in 2005 and has grown in importance, supporting as it does technological developments that impact upon the expanding user-base of planning and scheduling applications. The organization of this year's competition is divided into two tracks. We recognize there is a huge amount of work involved in organizing and running this competition, and also in participating in it.

We would like to express our thanks to all of the members of the Program Committee, who performed so well in reviewing the submissions. We would like to thank the Organizing Committee for their efforts in organizing the events and activities of this conference, as well as for providing local arrangements and other support. Without their talent and dedication, and without the expertise and hard work of the Program Committee in reviewing the submitted papers, this conference would not have been possible.

Finally, we thank our sponsors *Artificial Intelligence,* Adventium Labs, David E. Smith, IBM Research, SIFT, NICTA (National ICT Australia Limited), National Science Foundation (NSF), Universidade de Sao Paulo (USP), Sociedade Brasileira de Automatica (SBA), Sociedade Brasileira de Computacao (SBC), Centro Universitario da FEI, UNESP, Universidade Federal do Parana (UFPR), and Universidad Simon Bolivar (USB).

We hope that this volume maintains the tradition of past ICAPS proceedings and becomes a valuable reference for researchers and practitioners in the field of automated planning and scheduling.

– Lee McCluskey, Brian Williams,
José Reinaldo Silva, and Blai Bonet
ICAPS 2012 Chairs