Preface

This volume contains the papers accepted for presentation at ICAPS 2014, the Twenty-Fourth International Conference on Automated Planning and Scheduling, held on June 21-26 in Portsmouth, New Hampshire, USA. 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 papers included in this volume are those selected for plenary presentation at ICAPS 2014. They consist of papers covering original work from the main track (39 long papers and 7 short papers out of 112 submissions), the papers from the special track on novel applications (6 long papers and 1 short paper out of 24 submissions), and papers from the new robotics track (7 long papers and 2 short papers out of 28 submissions). The volume also contains summary papers from the journal presentation track (8 papers out of 19 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 overall acceptance rate for original work at ICAPS 2014 was just under 38%.

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, and the empirical evaluation of planning and scheduling techniques. They reflect recent research trends in subareas such as optimal planning, probabilistic and non-deterministic planning, path planning, multi-agent planning, and new developments in heuristics and their analysis for planning algorithms.

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: Malik Ghallab (LAAS-CNRS, France), Michael Littman (Brown University, USA), and Peter Wurman (Kiva Systems, USA).

This year ICAPS introduced a special track on robotics to encourage the submission of papers describing all aspects of planning and scheduling in the context of robotics. In the call for this track we specifically solicited papers covering topics such as: combining task and motion/manipulation planning; planning for perception; multi-robot planning and coordination; interleaved planning and execution; planning in dynamic environments; planning for human robot interaction; acquisition of planning models for robotics; integration of planning on robots; learning action and task models; and planning in open domains. The special track was cochaired by Felix Ingrand (LAAS-CNRS, France) and Leslie Kaelbling (MIT, USA) and had a separate program committee consisting of individuals with experience working at the intersection of robotics and automated planning. The papers in this track demonstrate the potential for work on planning and scheduling to impact robotics and vice versa. We hope that this year's Robotics Track will be the first of many to come.

This is the second year of the special track on novel applications, which is intended to encourage the submission of papers describing all aspects of the development, deployment and eval-

uation of planning and scheduling systems for real-world problems. In the call for this track we specifically solicited papers covering topics such as: description and modeling of novel application domains; engineering issues in using planning and scheduling techniques; integration of multiple planning and scheduling techniques, or of planning and scheduling techniques with techniques from other areas or disciplines; user interface design, visualization and explanation for a planning / scheduling application; experiences in deployment and maintenance of planning / scheduling applications; evaluation, testing, and validation of planning / scheduling applications; assessment of impact on end users. The special track was cochaired by David Smith (NASA Ames Research Center, USA) and Roman Bartak (Charles University, Czech Republic) and had a separate program committee consisting of individuals with experience working on applications of planning and scheduling technology to real world problems. In order to ensure that papers were reviewed fairly, the track had its own review form which evaluated papers using different criteria from the main track, including significance of the application problem being addressed; importance of planning and scheduling technology to solution of the problem; novelty of the application and technical approach to the application; evaluation of the system; clarity of the descriptions of the application problem, techniques used, and results. We believe that the novel application papers that appear in this proceedings demonstrate the increasing potential for application and deployment of planning and scheduling techniques.

This is also the second year that ICAPS has included the journal presentation track. The track is designed to provide a forum to discuss important results in the area of automated planning and scheduling that appeared recently in selective journals, but have not been previously presented at ICAPS or a major AI conference. The goal of this track is two-fold: (1) to provide authors an opportunity to present at the conference important results published in journals that might otherwise not be submitted to the conference due to their length and complexity, and (2) to broaden the program with lines of work at the intersection between planning / scheduling and related fields such as constraint programming, knowledge representation and reasoning, machine learning, multiagent systems, robotics, and operations research. The track, organized by Ronen Brafman (Ben-Gurion University, Israel), accepted 8 out of 19 submissions for which short summaries of much of the work are included in the proceedings.

The ICAPS 2014 conference program also includes two days of satellite events, including 8 workshops, 7 tutorials, a doctoral consortium, and an application showcase event. The diverse workshops program, organized this year by Amanda Coles (King's College London, UK) and Subbarao Kambhampati (Arizona State University, USA) consists of the Scheduling and Planning Applications Workshop, Models and Paradigms for Planning under Uncertainty: A Broad Perspective, Distributed and Multi-Agent Planning, Model Checking and Automated Planning, Knowledge Engineering for Planning and Scheduling, Constraint Satisfaction Techniques, Planning and Robotics, and Heuristics and Search for Domain-Independent Planning.

The very successful ICAPS tutorial program continues this year, organized by Andrew Coles (King's College London, UK) and Sven Koenig (University of Southern California, USA). The tutorial program includes perspectives on Task and Motion Planning for Robots in the Real World (Siddharth Srivastava and Sachin Patil), Introduction to Planning Domain Modeling in RDDL (Scott Sanner), Decision Diagrams in Automated Planning and Scheduling (Scott Sanner), PSVN: A Hands-On Tutorial (Rob Holte), Scheduling Problems: Case Studies and Solution Techniques (Nysret Musliu), From Single-Agent Pathfinding to Multi-Agent Pathfinding and in Between (Ariel Felner and Nathan Sturtevant), and Constraint-Based Temporal Reasoning (Roman Barták, Robert A. Morris, and K. Brent Venable).

The system demonstration and exhibits pro-

gram at ICAPS 2014, organized by Jeremy Frank (NASA Ames Research Center, USA) and Robert Goldman (SIFT, USA), provides an opportunity for planning and scheduling researchers and practitioners to demonstrate their state-of-the-art implementations in action. This event allows the community to experience the latest contributions while broadening the reach of novel methods to more conference attendees.

Following the tradition of recent ICAPS conferences, a rich program for students included a doctoral consortium, organized by Susanne Biundo (Universität Ulm, Germany) and Julie Shah (Massachusetts Institute of Technology, USA), providing students the opportunity to present their current research during the conference and receive early feedback from experts in the field.

We would like to express our thanks to all of the members of the Program Committee, who did an outstanding job in reviewing the submissions, and to the senior program committee for their attentiveness and dedication to ensuring that each paper received fair treatment. A kind thanks also goes to our publicity chair Neil Yorke-Smith (American University of Beirut, Lebanon) for helping to spread the word about this event.

A huge thanks goes to our local arrangement chair, Scott Kiesel (University of New Hampshire, USA), whose tremendous work and dedication made the event possible.

We would like to also thank the sponsorship chairs Mark Boddy (Adventium Labs, USA), Joerg Hoffmann (Saarland University, Germany), and Sylvie Thiebaux (Australian National University, Australia) and our sponsors (listed apart in this proceedings). Without the great job of the sponsorship chairs and the support of the sponsors, this conference would have never been held.

Finally we would like to thank the ICAPS Council, that trusted us to organize ICAPS 2014 in Portsmouth and has helped and advised us throughout the organization of the conference. We believe that this volume maintains the tradition of quality work of past ICAPS proceedings and look forward to seeing the longer lasting impact that these works might have both within and outside of the automated planning and scheduling community.

– Steve Chien, Minh Do,
Alan Fern, and Wheeler Ruml
ICAPS 2014 Chairs