Preface

This volume contains the papers accepted for presentation at ICAPS 2022, the Thirty-Second International Conference on Automated Planning and Scheduling, to be held virtually, June 13-24, 2022. 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 85 papers included in this volume, consisting of 71 long papers and 14 short papers, are those selected for plenary presentation at ICAPS 2022 from a total of 277 submissions. All submissions were reviewed by the international 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 multi-agent path finding, reinforcement and deep learning, explainable planning and scheduling, and new developments in heuristics for planning algorithms. Applications that are considered span diverse areas ranging from more traditional applications (e.g., maintenance scheduling and robotics) to more recent applications (e.g., smart transportation in smart cities).

From this excellent collection of papers, six were selected for special recognition:

- "Learning General Optimal Policies with Graph Neural Networks: Expressive Power, Transparency, and Limits" by Simon Ståhlberg, Blai Bonet, and Hector Geffner was selected for the Best Paper Award.
- "Planning for Risk-Aversion and Expected Value in MDPs" by Marc Rigter, Paul Duckworth, Bruno Lacerda, and Nick Hawes was selected for the Best Paper Runner-Up Award.
- "Solving Simultaneous Target Assignment and Path Planning Efficiently with Time-Independent Execution" by Keisuke Okumura and Xavier Défago was selected for the Best Student Paper Award.
- "Cost Partitioning Heuristics for Stochastic Shortest Path Problems" by Thorsten Klößner, Florian Pommerening, Thomas Keller, and Gabriele Röger was selected for the Best Student Paper Runner-Up Award.

- "Hyper-Heuristics for Personnel Scheduling Domains" by Lucas Kletzander and Nysret Musliu was selected for the Best Industry and Applications Track Paper Award.
- "Flexible FOND HTN Planning: A Complexity Analysis" by Dillon Z. Chen and Pascal Bercher was selected for the Best Undergraduate 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 five distinguished speakers: Emma Brunskill (Reinforcement Learning for Human-Focused Applications), Malte Helmert (Beyond Distance Estimates: Reasoning about Solutions in Factored Transition Systems), Sven Koenig (Multi-Agent Path Finding and Its Applications), Timothy Miller (Explainable Artificial Intelligence: Beware the Inmates Running the Asylum (or How I Learnt to Stop Worrying and Love the Social and Behavioral Sciences)), and Siddhartha Srinivasa (New Connections Between Motion Planning and Machine Learning for Robotics).

In addition to the Planning and Learning, Industry and Applications, and Journal Presentations tracks, three special tracks in ICAPS of prior years, this year, the conference introduced a new special track on Human-Aware Planning and Scheduling. In response to the growing interest in designing AI systems to complement and enhance, rather than supplant, human capabilities, this track focused on planning and scheduling systems that account for, and fluidly interact with, the humans in the loop. Topics included mixed-initiative planning and scheduling; explainable planning and scheduling; safety, ethics, fairness, and transparency in planning and scheduling systems; and trust, communication, and collaboration in human-AI teams. All the special tracks, with the exception of the Journal Presentations track, have separate program committees with expertise in the relevant disciplines.

The ICAPS 2022 Conference Program also included six days of satellite events, including ten workshops, four tutorials, and a doctoral consortium. The workshops this year are Hierarchical Planning; Bridging the Gap Between AI Planning and Reinforcement Learning; Reliable Data-Driven Planning and Scheduling; Planning and Robotics; Explainable AI Planning; Integrated Planning, Acting, and Execution; Planning for Financial Services; Deception Against Planning Systems and Planning in Adversarial Conditions; Heuristics and Search for Domain-Independent Planning; Scheduling and Planning Applications; and Knowledge Engineering for Planning and Scheduling.

The tutorials offer in-depth perspectives on the following topics: Quantum computing; neural-symbolic reasoning; representation learning for acting and planning; and CALDERA, a cyber operations automation platform. Following the tradition of 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.

We would like to express our sincerest gratitude to all of the members of the Program Committee, who performed admirably in reviewing the submissions. We would like to also thank the Organizing Committee for their efforts, behind the scenes, in organizing the events and activities of this conference. 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, David E. Smith, Invitae, JPMorgan Chase Bank National Association, Nissan, IBM Research, SIFT, Google, and Adventium Labs.

We hope 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.

Akshat Kumar and Pradeep Varakantham
ICAPS 2022 Conference Chairs

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