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Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems

10th International Conference, CPAIOR 2013
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Proceedings



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Preface

This volume is a compilation of the research program of the 10th International Conference on the Integration of Artificial Intelligence (AI) and Operations Research (OR) Techniques in Constraint Programming (CPAIOR 2013), held at the IBM worldwide research headquarters, the T.J. Watson Research Center, Yorktown Heights, NY, during May 18–22, 2013. More information about the conference can be found at: <http://www.cis.cornell.edu/ics/cpaior2013/>

The CPAIOR Conference Series

After a successful series of five CPAIOR international workshops in Ferrara (Italy), Paderborn (Germany), Ashford (UK), Le Croisic (France), and Montreal (Canada), in 2004 CPAIOR evolved into a conference. More than 100 participants attended the first meeting held in Nice (France). In the subsequent years, CPAIOR was held in Prague (Czech Republic), Cork (Ireland), Brussels (Belgium), Paris (France), Pittsburgh (USA), Bologna (Italy), Berlin (Germany), and Nantes (France). This year CPAIOR was held in the USA.

The aim of the CPAIOR conference series is to bring together researchers from constraint programming (CP), artificial intelligence (AI), and operations research (OR) to present new techniques or applications in the intersection of these fields, as well as to provide an opportunity for researchers in one area to learn about techniques in the others. A key objective of the conference is to demonstrate how the integration of techniques from different fields can lead to highly novel and effective new methods for large and complex problems. Therefore, papers that actively combine, integrate, or contrast approaches from more than one of the areas were especially welcome. Application papers showcasing CP/AI/OR techniques on innovative and challenging applications or experience reports on such applications were also strongly encouraged.

Program, Submissions, and Reviewing

The main CPAIOR 2013 program featured invited presentations from Peter van Beek on “Constraint Programming in Compiler Optimization: Lessons Learned,” Andreas Krause on “Sequential Decision Making in Experimental Design and Computational Sustainability via Adaptive Submodularity,” Vijay Saraswat on “Scalable Concurrent Application Frameworks for Constraint Solving,” and an invited tutorial on “Recent Advances in Maximum Satisfiability and Extensions” by Carlos Ansotegui.

Seventy-one full papers were submitted to the conference. Out of these, 20 long papers and, additionally, 11 short papers were selected for presentation in the main technical program of this year’s conference. Moreover, more than 15

presentation-only papers were submitted. These latter papers were not formally reviewed and are therefore not part of these proceedings.

As the conference is relatively small, the Program Chairs decided to develop and test a revised reviewing format. In other communities, papers are typically reviewed in depth by three members of the Program Committee (PC). In the Program Chairs' experience, this format works well in terms of filtering papers that are below the conference standards. However, interesting novel contributions that open exciting new research avenues can fall through the cracks more easily than incremental advancements in established fields of research. Clearly, this is not desirable.

To address this issue, the Program Chairs first assembled a large PC of almost 70 distinguished researchers, who we wish to thank whole-heartedly for their voluntary service to our community. Each paper was reviewed in depth by four PC members. The four initial reviews were sent to the authors and they were asked to provide their feedback. The initial reviewers then had a discussion and had the opportunity to adjust their reviews based on the authors' rebuttal. Seven additional PC members were assigned to each paper to simply vote yes or no, without the need to write a review. So in the end there were 11 votes per paper (four initial and seven additional). Those papers with at least six votes in favor were accepted for publication.

This scheme changed the traditional roles of the reviewers. They could no longer decide among themselves, they instead needed to convince seven other PC members. We found that this procedure positively changed the tone of the reviews. Moreover, the voting procedure meant that reviewers did not have to achieve consensus and could provide individual points of view until the very end.

On the other hand, the voting scheme resulted in a relatively large acceptance rate. All 20 long papers in these proceedings turned out to have at least eight votes in favor of publication. Since the Program Chairs did not want to overrule two-third majorities, all of these 20 papers were accepted in the main program.

Masterclass and Workshops

It is a wonderful tradition at CPAIOR that the main conference is preceeded by a weekend full of vibrant talks organized in a masterclass, as well as several workshops. This year's masterclass theme was on "Computational Sustainability: Optimization and Policy-Making." In addition, the program included three workshops on "Parallel Methods for Combinatorial Search and Optimization," on "Algorithm Selection," and on "General Principles in Seeking Feasible Solutions for Combinatorial Problems."

Many thanks to our Masterclass Chair Barry O'Sullivan, our Workshop Chair Horst Samulowitz, all workshop organizers, and all conference presenters. We especially thank our Conference Chair Ashish Sabhrawal, Publicity Chair Bistra Dilkina, Sponsorship Chair Stefan Heinz, and our conference manager Megan McDonald who all did an outstanding job organizing this event. Thanks also once more to all members of the PC and all reviewers.

Sponsors

The cost for holding an event like the CPAIOR conference would be much higher without the help of generous sponsors. We received outstanding support from the Institute for Computational Sustainability at Cornell University, IBM Research, and SAS. We also thank the Association for Constraint Programming (ACP), GAMS, and NICTA, as well as AIMMS, AMPL, Jeppesen, and SICS. Finally, thanks to Springer and EasyChair for their continuing support of the CPAIOR conference series.

February 2013

Carla Gomes
Meinolf Sellmann

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