

Guest Editorial

Automated planning and scheduling

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In the last fifteen years, AI planning and scheduling techniques have been characterized by an impressive increase of their performances in terms of size and complexity of the solutions produced. These improvements are related to the definition of new data structures which can efficiently encode and make explicit constraints that are only implicitly defined in problem formulation, and to the definition of heuristics that allow one to visit only the most promising parts of the search space. Quite interesting, an increasing number of systems started to adopt planning and scheduling techniques in order to afford complex application contexts, and obtaining solutions that better fit the problem constraints and the users' needs. This special issue contains extended versions of selected papers presented at IPS 2013, the 5th Italian Workshop on Planning and Scheduling held in Torino, Italy, December 4th, 2013.¹ IPS 2013 was held within the XIII Conference of the Italian Association for Artificial Intelligence (AI*IA 2013), gathered together researchers interested in different aspects of planning and scheduling, and introduced new researchers to the community. For this edition of IPS, the call for papers solicited submissions of two different types: full papers and short papers. Full technical papers reported work in progress or completed work, while short papers reported views or

ambitions of the field, or described open problems. At the workshop, 14 papers in various areas of Automated Planning & Scheduling were presented: Algorithms, Applications, Architectures, Formal Models, Knowledge engineering for planning, Learning, Memory Based Approaches, Hybrid Systems, Constraint-based Planning/Scheduling and Control Techniques, Coordination Issues in Decentralised/Distributed planning/scheduling, Planning/scheduling under uncertainty.

After a further review process, the following four papers were selected for this special issue.

Towards Data Cleansing via Planning by Boselli, Cesarini, Mercorio and Mezzanzanica, presents an application of planning to the domain of Data Cleansing. Most of the research on data quality is aimed to automatically identify cleansing activities, namely a sequence of actions able to cleanse a dirty dataset, which are often developed and coded manually requiring a relevant effort for domain-experts. The use of AI planning techniques allows one to model data quality requirements and automatically identify cleansing activities, thus contributing in addressing some relevant data cleansing issues.

Plan Repair Driven by Model-Based Agent Diagnosis by Micalizio, considers the problem of defining plan repair strategy in the Multiagent domain, where a team of agents cooperate with one another to reach a common goal by performing actions concurrently; unfortunately, repairing a Multi Agent Plan is a very challenging task.

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¹<http://ips2013.istc.cnr.it/>

The use of P&S techniques allow one to react to an action failure and to mitigate the harmful effects of the failure.

Planning Meets Verification and Validation in a Knowledge Engineering Environment by Orlandini, Bernardi, Cesta and Finzi, considers the use of planning in real-life applications that require properties like robustness, structural guarantee and safety criticality, since they have been successfully deployed in application areas that require such formal properties. This paper considers the KEEN system that integrates classical knowledge engineering features with services that allow the automated domain validation, planner validation and plan verification.

Efficient DTPP Solving with a Reduction-Based Approach by Maratea and Pulina, considers the Disjunctive Temporal Problems with Preferences (DTPPs) which provide a convenient formal framework for representing and processing temporal knowledge. The goal is to find an assignment to the variables of the problem that maximizes the sum of the preference values of satisfied disjunctions of constraints, where such values are obtained by aggregating the preference functions of the satisfied constraints in it.

We thank all members of the IPS Program Committee for their effort in the review process that was fundamental for maintaining the high scientific level of the workshop. We thank the AI*IA council, who trusted us to organize IPS-2013, and all the researchers of the planning and scheduling community who supported this event by submitting their work and participating actively in it. Finally, we would like to express our gratitude to Oliviero Stock, Editor in Chief of *Intelligenza Artificiale*, for hosting this special issue.

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