

Preface

This volume contains the papers presented at IPS 2022, (10th Italian Workshop on Planning and Scheduling <http://ips2022.istc.cnr.it>), RiCeRcA 2022 (RCRA Incontri E Confronti <https://ricerca2022.wordpress.com>) and SPIRIT 2022 (Workshop on Strategies, Prediction, Interaction, and Reasoning in Italy <https://gatti.faculty.polimi.it/spirit22/>) Workshops, held within the XXI Conference of the Italian Association for Artificial Intelligence (AI*IA 2022), from November 28 to December 2, 2022.

The aim of the IPS series of workshop is to bring together researchers interested in different aspects of planning and scheduling, and to introduce new researchers to the community. Although the primary target of IPS workshops is the Italian community of planning and scheduling, the aim is also to attract an international gathering, fostering contributions and participation from around the world. In particular, this year, 9 papers were accepted for presentation at the workshop, involving different authors from Italy and other European countries. Moreover, this year in conjunction with SPIRIT 2022, we also had an invited talk by Prof. Giuseppe De Giacomo, a leader in several aspects of AI Planning, from theory to their applications.

The IPS accepted papers mainly focus on Hybrid Systems [1], Symbol Grounding Problem in Neuro-Symbolic Planning [2], Timeline-based Planning [3], Planning with Qualitative Constraints [4], Epistemic Planning [5], online grounding in Unknown Environments [6], on the use of the Unified Planning Framework [7], on the use of Transformers for Automated Planning [8] and Real-Time Urban Traffic Routing [9].

The scope of the RiCeRcA workshop is, instead, fostering the cross-fertilisation of ideas stemming from different areas, proposing benchmarks for new challenging problems, comparing models and algorithms from an experimental viewpoint, and, in general, comparing different approaches with respect to efficiency, problem modelling, and ease of development. In particular, this year 9 papers were accepted for presentation at the workshop, involving different authors from Italy and other European countries.

The 2022 edition of RiCeRcA accepted papers considering a wide range of combinatorial problems. In particular, the workshop included works leveraging on ASP techniques to perform urban traffic optimisation and master surgical scheduling [10, 11]; approaches for the verification of neural networks [12, 13] and on the projectivity of Markov logic networks [14]; approaches for model learning [15] and supervisions [16], and exciting discussions around divagrarie [17] and the importance of declarative AI methods in videogames [18].

The scope of the SPIRIT workshop is gathering the scientific communities on artificial intelligence, machine learning, theoretical computer science, multi-agent systems, and microeconomics to promote their integration and contamination. Over the past fifteen years, researchers in artificial intelligence, machine learning, theoretical computer science, multi-agent systems, and microeconomics have joined forces to tackle problems involving incentives and computation. Interestingly, while microeconomics provides computer science with the basic models, computer science raises crucial questions related to computation and learning that suggest the study of new models. The result is a synergic integration of all these fields. Interestingly, the final goal is the provision of rigorous, theoretically-proved methods to deal

with multiple strategic players. In the last years, these topics have been central in the Artificial and Machine Learning venues.

The SPIRIT 2022 accepted papers mainly focused algorithmic game theory, coalition formation, swap equilibria, price of anarchy and stability [19], influence maximization, stochastic probing, approximation algorithms, online learning [20], formal methods for multi-agent strategic reasoning [21, 22, 23, 24], including formal methods for the automated mechanism design and synthesis of strategies [25], formal aspects of attack graphs [26], model checking and runtime verification for multi-agent systems [27], and tools for the strategic reasoning [28, 27].

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Workshops Organizers

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