

Introduction to the Special Issue on Logic Rules and Reasoning: Selected Papers From the 6th International Joint Conference on Rules and Reasoning (RuleML+RR 2022)

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This special issue comprises extended versions of some selected papers accepted at the 6th International Joint Conference on Rules and Reasoning. This conference was held from 26th to 28th of September 2022 and was collocated with the Rule Challenge and a Doctoral Consortium. All of these events were for the third time part of the umbrella event Declarative AI which was held as a virtual event due to the COVID 19 pandemic. Declarative AI comprises many scientific events dedicated to results on symbolic methods for modelling and reasoning. The contributions range from foundational, theoretical results on logic-based formalisms to descriptions of academic prototype systems for reasoning. Thereby, this umbrella event successfully fosters exchange between academia and industry on the topic of symbolic reasoning. At the time of writing the 6th edition of Declarative AI is already in preparation.

The technical program of the RuleML+RR 2022 conference included 19 presentations of peer-reviewed research papers and system descriptions. As part of the conferences paper selection process, each submission was reviewed by at least three reviewers. The papers presented at the RuleML+RR conference of 2022 and now extended in this special issue were selected for their high scores by the RuleML+RR reviewers and their strong thematic overlap with the journal *Theory and Practice of Logic Programming*. These

papers cover research topics mainly dedicated to Answer Set Programming or to temporal reasoning in rule-based systems.

- *Plingo: A system for probabilistic reasoning in Answer Set Programming* by Susana Hahn, Tomi Janhunen, Roland Kaminski, Javier Romero, Nicolas Nicolas Rühling, and Torsten Schaub (This contribution was awarded the *Harold Boley best system description*.)
- *The Temporal Vatalog System: Temporal Datalog-based Reasoning* by Luigi Bellomarini, Livia Blasi, Markus Nissl, Emanuel Sallinger
- *On the generalization of learnt constraints in ASP solving for temporal domains* by Javier Romero, Torsten Schaub, and Klaus Strauch
- *Practical Reasoning in DatalogMTL* by Dingmin Wang, Przemyslaw Andrzej Walega, Pan Hu, and Bernardo Cuenca Grau

All of these papers are substantially extensions of the conference versions that were thoroughly peer-reviewed and that cover additional results.

We would like to thank all of the reviewers for their professional work throughout the multi-stage reviewing process. Their comments and positive criticism led to notable improvements of the accepted papers of this special issue. Moreover, we are grateful to everybody who helped make the RuleML+RR 2022 conference a success, including the programm committee members, reviewers, and authors.

Finally, we would like to express our deep thanks and great appreciation to Thomas Eiter and Mirek Truszczynski, from the journal *Theory and Practice of Logic Programming* for their continued help and support.

We hope you enjoy reading the RuleML+RR 2022 special issue!

Guido Governatori and Anni-Yasmin Turhan