



Logical aspects of multi-agent systems

Preface

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This is a special issue of the 10th Workshop on Logical Aspects of Multi-Agent Systems (**LAMAS 2020**). The LAMAS workshop provides a forum for the research community working on various logical aspects of multi-agent systems (MAS) from the perspectives of artificial intelligence, computer science, and game theory. It addresses the whole range of issues that arise in the context of using logic in MAS, from theoretical foundations to algorithmic methods and implemented tools. The workshop has been regularly organised since 2002 and became the main annual event of the LAMAS research network.

LAMAS 2020 was held online as a satellite workshop of **AAMAS 2020**. In order to accommodate live presentations and various time-zones, it was held over three days, May 8–10, 2020. It consisted of 11 accepted presentations, and an invited talk by Giuseppe De Giacomo.

Selected papers from **LAMAS 2020** were invited to submit significant extensions to the special issue, and after a thorough single-blind review process, 3 submissions were accepted.

In *The Logic of Secretly Knowing and the Interpolation Rule*, Zuojun Xiong and Thomas Ågotnes formalise what it means for an agent to know a secret. They do this in the context of epistemic logic, a standard framework for formalising knowledge, and introduce a "secretly knows" modality for an agent. They investigate validities (under various axiomatisations of epistemic logic), the interaction with standard knowledge modalities, and they characterise the new modality in the landscape of non-normal modal logics.

In *On the Complexity of Rational Verification*, Julian Gutierrez, Muhammad Najib, Giuseppe Perelli, and Michael Wooldridge study a natural counterpart to model-checking that considers the problem of deciding if there exists a Nash-equilibrium in certain infinite-

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duration path-forming games played on finite-graphs. The paper studies restrictions on the agent and system objectives that lower the computational complexity of rational verification, including the GR(1) fragment of linear-time temporal logic that naturally captures response properties, and mean-payoff utility functions that are a popular formalism for capturing quantitative objectives.

In *Raising Awareness without Disclosing Truth*, Line van den Berg, Manuel Atencia and Jérôme Euzenat introduce a logical framework for representing how agents become aware of changes in the propositional vocabulary that other agents use to communicate information. They do this in the context of Dynamic Epistemic Logic, a logic for specifying and reasoning about information flow in multi-agent systems. They propose and study a new semantics which allows agents to distinguish between being certain about the truth-value of a proposition and being aware of a proposition.

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Data Availability No datasets were generated or analysed during the current study.

Declarations

Conflicts of interest The authors declare that they have no conflict of interest.

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