

QUEST 2023

Invited Talk

(Thursday 21st September, 16:00-17:00 CEST)

Multi-Agent Verification and Control with Probabilistic Model Checking

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Abstract:

Probabilistic model checking builds upon ideas and techniques from a diverse range of fields, from logic, automata and graph theory, to optimisation, numerical methods and control. In recent years, it has also been extended to integrate ideas from game theory, notably using models such as stochastic games and solution concepts such as equilibria, to formally verify the interaction of multiple rational agents with distinct objectives. This provides a means to reason flexibly about agents acting in either an adversarial or a collaborative fashion, and opens up opportunities to tackle new problems within, for example, artificial intelligence, robotics and autonomous systems. This talk will summarise some of the advances in this area, and highlight applications for which the techniques have already been used. It will discuss how the strengths of probabilistic model checking apply, or have the potential to apply, to the multi-agent setting and outline some of the key challenges required to make further progress in this field.