Preface

Since Artificial Intelligence applications became mature, there has been growing interest in applying them into complex real equipments, especially in order to implement "Cyber-Physical Systems" (CPS). Unfortunately, most AI algorithms are characterized by unpredictable or high-variance performances, making them almost unusable for real-time control under hard deadlines.

Recently some researches focused on tailoring AI techniques to make them more predictable by explicitly reasoning "within and about" strict timing constraints (deadlines and precedence constraints between different tasks), but unfortunately, as far as we know, little effort has been spent to transfer these approaches over Multi-Agents Systems (MAS), where additional constraints deriving from concurrent use of mutually exclusive resources hold (internal memory, communication channels and peripherals such as sensors and actuators).

MAS have always been a relevant topic within AI, since its very beginning, and nowadays their technological advancements are leading to a concrete adoption of decentralized systems with ever increasing connections, interactions, and computational capabilities. Radically new challenges are arising for MAS from the domains of the "Internet of Things" (IoT), CPS and "safety-critical" systems but, unfortunately, in these regards MAS tend to reproduce the same myopic approach of their parent discipline: high-quality of reasoning and human-like interaction with little regard to concrete temporal and resources constraints. In "safety-critical" systems MAS have not only to exhibit rational human-standard behaviors, but they must also guarantee the completions of tasks within their deadlines without violating priorities and precedences constraints in accessing mutually exclusive resources.

The 1st International Workshop on Real-Time compliant Multi-Agent Systems (RTcMAS) gathers contributions from both theoretical and pragmatic perspectives, targeting the employment of MAS in IoT and CPS through the exploitation of methodologies, algorithms and technologies from the Real-Time Community. As such, RTcMAS has the potential to gather the attention of the AI-interested audience from IJCAI-ECAI and AAMAS, with the goal of building the grounds for the next-generation Intelligent CPS, capable to face the challenges of the "ever more connected" IoT era.

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