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SPECIAL ISSUE ON:

Recent Advances in Control and Verification for Hybrid Systems

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The study of dynamical systems has focused, for the most part, on the two distinct areas of continuous-time and discrete-event systems. In recent years, interest has emerged in a class of systems that combine both continuous-time dynamics and discrete-event behaviors, which are referred to as hybrid systems. Typical examples of hybrid systems have been observed in various applications such as cyber-physical systems, mechanical systems, process control systems, the automotive industry, power systems, aircraft and traffic control systems, and economics and societal systems. Designing controllers and verifying specifications for hybrid systems raises severe methodological questions because they necessitate the combination of continuous variable system descriptions like differential equations with discrete-event models. Hybrid system methodologies are mostly based on the principles and results of the theories of continuous and discrete systems and, due to the greatly growing demands on control and verification for hybrid systems, extending and merging the contributions coming from different disciplines is posing a great challenge. The purpose of this special issue is to explore the latest advances in theoretical analysis, numerical simulation, data-driven methods, experimental observation, and engineering applications in hybrid systems. This special issue aims to offer a venue for researchers from various fields to make a rapid exchange of ideas and original research findings in hybrid systems. We are particularly interested in new interdisciplinary approaches in system sciences and real-world applications, or strong conceptual foundations in newly evolving topics. Potential topics of interests include, but are not limited to:

- Hybrid system modeling and identification
- Experimental methods and computational methods in hybrid systems
- Discrete-event driven systems, hybrid automata and Petri nets
- Switched, piecewise affine and stochastic jump systems
- Formal methods in control for hybrid systems
- Reach set computation and verification for hybrid systems
- Control and verification for data-driven hybrid systems
- Adaptive control for hybrid systems
- Optimisation and design for hybrid systems
- Applications to cyber-physical systems, autonomous systems, robotics systems, etc.

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