

Hybrid Dynamical Systems Modeling Stability And Robustness Short Reviews

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Hybrid Dynamical Systems Modeling Stability

With the tools of modern mathematical analysis, Hybrid Dynamical Systems unifies and generalizes earlier developments in continuous-time and discrete-time nonlinear systems. It presents hybrid system versions of the necessary and sufficient Lyapunov conditions for asymptotic stability, invariance principles, and approximation techniques, and examines the robustness of asymptotic stability, motivated by the goal of designing robust hybrid control algorithms.

Hybrid Dynamical Systems: Modeling, Stability, and ...

Filled with a wealth of examples to illustrate concepts, this book presents a complete theory of robust asymptotic stability for hybrid dynamical systems that is applicable to the design of hybrid control algorithms--algorithms that feature logic, timers, or combinations of digital and analog components.

Hybrid Dynamical Systems: Modeling, Stability, and ...

Targeted at graduate students in engineering with an interest in dynamics and control, but equally valuable to experienced researchers in the modeling and analysis of applied dynamical systems, this text establishes a systematic framework for conceptualizing hybrid dynamical systems and their solutions.

Review of "Hybrid Dynamical Systems: Modeling, Stability ...

Switched systems, or in general, hybrid dynamical systems provide a framework for modeling a large class of physical phenomenon and engineering systems which combine discrete and continuous dynamics.

Hybrid dynamical systems: Modeling, stability, and robustness

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Hybrid Dynamical Systems - Princeton University Press

Stability theory for hybrid dynamical systems Abstract: We first formulate a model for hybrid dynamical systems which covers a very large class of systems and which is suitable for the qualitative analysis of such systems.

Stability theory for hybrid dynamical systems - IEEE ...

the motions of hybrid dynamical systems (Lagrange stability). To demonstrate the applicability of the developed theory, we present specific examples of hybrid dynamical systems and we conduct a stability analysis of some of these examples (a class of sampled-data feedback control systems with a nonlinear (continuous-time)

Stability Theory for Hybrid Dynamical Systems - Automatic ...

introduction of switching and state jumps in hybrid systems non-trivially extend the dynamical behaviors that can be modeled by hybrid system models compared with traditional modeling frameworks, such as ordinary differential equations and automata. Hence, hybrid system models are of interest in themselves, and have been suc-

Hybrid Dynamical Systems: An Introduction to Control and ...

Hybrid systems are dynamical systems consisting of interacting discrete event and continuous state subsystems. A controlled hybrid automaton is a hybrid automaton whose continuous-state dynamics are described by inhomogeneous differential equations. This paper presents a sufficient condition for the existence of global non-terminating solutions in controlled hybrid automata.

Biped Robot Modeling and Control Using Controlled Hybrid ...

The main contribution of this paper is a number of structure dependent stability results applicable to a class of hybrid systems modelled by discrete automata. Our main results are formulated as two stability theorems giving necessary and sufficient conditions for global stability of synchronous and asynchronous piecewise linear hybrid systems.

On stability in hybrid systems - Semantic Scholar

With the tools of modern mathematical analysis, Hybrid Dynamical Systems unifies and generalizes earlier developments in continuous-time and discrete-time nonlinear systems. It presents hybrid system versions of the necessary and sufficient Lyapunov conditions for asymptotic stability, invariance principles, and approximation techniques, and examines the robustness of asymptotic stability, motivated by the goal of designing robust hybrid control algorithms.

Hybrid Dynamical Systems: Modeling, Stability ... - Scribd

Hybrid dynamical systems Abstract: Robust stability and control for systems that combine continuous-time and discrete-time dynamics. This article is a tutorial on modeling the dynamics of hybrid systems, on the elements of stability theory for hybrid systems, and on the basics of hybrid control.

Hybrid dynamical systems - IEEE Journals & Magazine

With the tools of modern mathematical analysis, Hybrid Dynamical Systems unifies and generalizes earlier developments in continuous-time and discrete-time nonlinear systems. It presents hybrid...

Hybrid Dynamical Systems: Modeling, Stability, and ...

Monotonicity of Functions Along Flows of Hybrid Inclusions; Inter-Event Times Analysis for Planar Linear Event-Triggered Controlled Systems (I) Multiple Barrier Function Certificates for Weak Forward Invariance in Hybrid Inclusions; On a Stabilizing Model Predictive Control Framework for Discretized Hybrid Dynamical Systems

