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Discontinuous dynamical systems - IEEE Journals & Magazine

ISS-Lyapunov Functions for Discontinuous Discrete-Time Systems Lars Grune and Christopher M. Kellett" Abstract Input-to-State

Stability (ISS) and the ISS-Lyapunov function have proved to be useful tools for the analysis and design of nonlinear systems in a variety of contexts. Motivated by the fact that many Discontinuous Systems Lyapunov Analysis And discontinuous Lyapunov function designed by looking at the system structure has been proposed for a point mass subject to Coulomb friction in feedback with a PID controller. The analysis proposed in this paper originates from the preliminary arguments presented in [22] where

more re-strictive classes of PWA systems and PWQ Lyapunov func-
Nonsmooth Lyapunov Analysis in Finite and Infinite ...

Nonsmooth Lyapunov Analysis in Finite and Infinite Dimensions provides helpful tools for the treatment of a broad class of dynamical systems that are governed, not only by ordinary differential equations but also by partial and functional differential equations. Existing Lyapunov constructions are extended to discontinuous

systems—those with variable structure and impact—by the involvement of nonsmooth Lyapunov functions.

Discontinuous Lyapunov Functions for Discontinuous ...

Discontinuous systems : Lyapunov analysis and robust synthesis under uncertainty conditions. [I?U? V Orlov] -- A major problem in control engineering is robust feedback design that stabilizes a nominal plant while also attenuating the influence of parameter variations and external disturbances.<p>This ...
Discontinuous systems : Lyapunov analysis and robust ...

Discontinuous Systems Lyapunov Analysis And Asymptotic stability of piecewise af fi ne systems with ...

Discontinuous Systems: Lyapunov Analysis and Robust Synthesis under Uncertainty Conditions Yury V. Orlov (auth.) A major problem in control engineering is robust feedback design that stabilizes a nominal plant while also attenuating the influence of parameter variations and external disturbances.

Discontinuous Systems Lyapunov Analysis And Robust ...

Discontinuous Systems develops nonsmooth stability analysis and discontinuous control synthesis based on novel modeling of discontinuous dynamic systems, operating under uncertain conditions. While being primarily a research monograph devoted to the theory of discontinuous dynamic systems, no background in discontinuous systems is required; such systems are introduced in the book at the appropriate conceptual level.

Stability analysis of discontinuous dynamical systems ...

Discontinuous dynamical systems arise in a large number of applications, including optimal control, nonsmooth mechanics, and robotic manipulation. Independently of the particular application, one always faces similar questions when dealing with discontinuous dynamical systems. The most basic one is the notion of solution.

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Discontinuous Systems: Lyapunov Analysis and Robust ...

Abstract: The paper presents mathematical tools required for fi nite-time stability analysis of discontinuous control systems using discontinuous Lyapunov functions. Elements of Filippov theory of di erential equations with discontinuous right-hand sides and stability notions are brie fl y observed.

Generalized Lyapunov method for discontinuous systems ...

Discontinuous Systems Lyapunov Analysis and Robust Synthesis under Uncertainty Conditions
Discontinuous Lyapunov Functions for Nonasymptotic ...

Discontinuous Lyapunov Functions for Discontinuous Nonlinear Systems Stephan Trenn Jan C. Willems Center for Systems and Control University of Groningen, Netherlands Ongoing joint work with Raffaele Iervolino (University of Naples Federico II, Italy) and Francesco Vasca (University of Sannio, Benevento, Italy) Nonpathological Lyapunov functions and discontinuous ...

ISS-Lyapunov Functions for Discontinuous Discrete-Time Systems Lars Grune and Christopher M. Kellett " Abstract Input-to-

State Stability (ISS) and the ISS-Lyapunov function are useful tools for the analysis and design of nonlinear systems. Motivated by the fact that many feedback control laws, such as model predictive or event-based control, lead to discontinuous discrete-time dynamics, we investigate ISS-

Discontinuous Systems: Lyapunov Analysis And Robust ...

For the scalar case, these results yield in particular the principal Lyapunov stability results for discontinuous dynamical systems reported earlier. We demonstrate the applicability of our results by studying a class of interconnected discontinuous dynamical systems and several specific examples.

1 ISS-Lyapunov Functions for Discontinuous Discrete-Time ...

With this motivation, Discontinuous Systems develops nonsmooth stability analysis and discontinuous control synthesis based on novel modeling of discontinuous dynamic systems, operating under uncertain conditions. Although it is primarily a research monograph devoted to the theory of discontinuous dynamic systems, no background in discontinuous systems is required; such systems are introduced in the book at the appropriate conceptual level.

Discontinuous Systems - Lyapunov Analysis and

Robust ...

Given a (differentiable) signal it is an important task for many applications to estimate on line its derivatives. Some well known algorithms to solve this problem include the (continuous) high-gain observers and (discontinuous) Levant ' s exact differentiators.

Discontinuous Systems: Lyapunov Analysis and Robust ...

The lack of these properties in examples drawn from various disciplines motivates the need for more general notions than the classical one. First, we introduced notions of solution for discontinuous systems. Second, we reviewed the available tools from non-smooth analysis to study the gradient information of candidate Lyapunov functions.

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Discontinuous Systems Discontinuous Systems develops nonsmooth stability analysis and discontinuous control synthesis based on novel modeling of discontinuous dynamic systems, operating under uncertain

conditions.

[0901.3583] Discontinuous Dynamical Systems: A tutorial on ...

Lyapunov-based analysis methods that achieve asymptotic convergence when the candidate Lyapunov derivative is upper bounded by a negative semi-definite function in the presence of differential...

Lyapunov Functions for Continuous and Discontinuous ...

Resorting to nonsmooth Lyapunov functions gives more flexibility in the stability analysis, in particular of piecewise linear, switched and discontinuous systems. They are also convenient in order to achieve general converse theorems (see Sontag, 1999 , Rifford, 2002).