Global Exponential Stabilization for a Class of Uncertain Nonlinear Systems through a Single Non-Fragile Input Control

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Abstract: *In this paper, the robust stabilization for a class of uncertain nonlinear systems with single input is explored. Using time-domain analysis combined with differential and integral inequalities, a non-fragile linear controller is designed to enable the closed-loop system to achieve global exponential stability. Simultaneously, the exponential convergence rate of the proposed systems is precisely calculated. This paper not only presents several numerical simulation examples, but also provides the circuit implementation of the controller to verify and illustrate the correctness and practicality of the main result..*

Keywords: nonlinear system, uncertain systems, global exponential stabilization, non-fragile control