1. Design of an adaptive terminal sliding-function controller for nonlinear multivariable systems

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Abstract: This paper presents an adaptive terminal sliding-function controller approach for controlling a class of nonlinear multivariable systems with uncertainty. An appropriate terminal sliding function (TSF) is designed and then applied to the control law. Based on the Lyapunov stability theory, the adaptive terminal sliding-function controller for nonlinear multivariable systems guarantees that the TSF is asymptotically convergent. Different from classical terminal sliding mode control, which uses a discontinuous switching control law, the TSF control uses a continuous TSF and thus avoids the chattering problem. The simulation results demonstrate that the proposed method achieves satisfactory stability. Copyright © 2013 John Wiley & Sons, Ltd. (20 refs)

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