2nd International Conference on Electro-Energy, ICEE2014

2014

Indirect adaptive backstepping control by using the virtual controls filtering

Y. Soukkou, S. Labiod, A. Boutaghane

Abstract : In this paper, by using the dynamic surface control technique, an indirect adaptive backstepping controller based x-swapping identifier with a gradient-type update law is proposed for a class of parametric strict-feedback nonlinear systems. The main steps of the controller design for a class of nonlinear systems in parametric strict-feedback form are described. Then, the closed-loop error dynamics is shown to be globally stable by using the Lyapunov stability approach. Simulation results for a single-link flexible-joint robot manipulator are given to illustrate the performance of the proposed controller.

Keywords : Backstepping control, adaptive control, dynamic surface control, Lyapunov stability, Single-link flexible-joint robot