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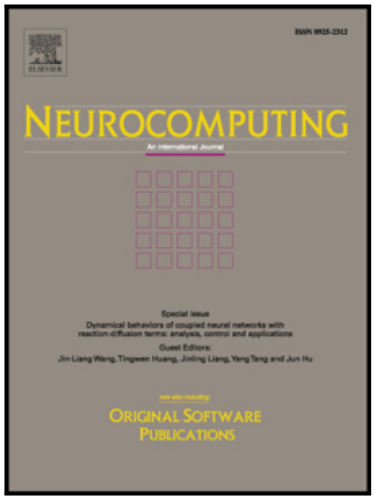

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Adaptive Neural Output Feedback Control For Stochastic Nonlinear Time-Delay Systems With Input And Output Quantization

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Abstract

The problem of output feedback adaptive tracking control is studied for a class of stochastic nonlinear time-delay systems in which the measured output and input signals are quantized by two sector-bounded quantizers respectively. An observer including the quantized input and output signals is designed to estimate the unknown system states, and the unknown system functions with less restrictions are dealt with by using the neural network(NN)'s approximation. By combining the backstepping technique and the Lyapunov-Krasovskii method, an observer-based adaptive neural quantized tracking control scheme is presented for this class of systems. The stability analysis indicates that the tracking error can converge to a small neighborhood of the origin while all closed-loop signals are 4-moment(or 2-moment) semi-globally uniformly ultimately bounded (SGUUB). Finally, two illustrative examples are provided to demonstrate the feasibility and effectiveness of the proposed design methodology.

Keywords: Stochastic nonlinear systems, quantization, output feedback, time delay, neural network

1. Introduction

With the wide application of networked control, quantization is often useful and inevitable in a lot of practical control systems [1]-[2]. The distinct

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