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Research Article

Experimental results of a control time delay system using optimal control

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Keywords: time delay systems; optimal control; experimental results; robust stability; industrial PID controller

Abstract

The optimal control for a temperature system with time delay is considered. Experimental results of the control system are presented in this contribution. The integral term in the controller is approximated by a quadrature method. Experimental results obtained demonstrate the effectiveness of the approximation method. By a simple analysis in time domain, we demonstrate the robustness of the optimal controller. We compare the optimal control's performance with an industrial PID controller. This controller was robustly tuned. The experiments indicate the correct optimization of the plant when the optimal control was employed, despite limitations in the sensor, actuators, non-modeled dynamics, and uncertain parameters of the process. Copyright © 2011 John Wiley & Sons, Ltd.

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