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Sliding Mode Control of a Robot Manipulator using Proportional-Integral Switching Surface

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Keywords

Nonlinear Systems, Tracking Controller, Sliding Mode Control, Matched Uncertainties

Abstract

This paper presents the development of a Proportional Integral sliding mode controller to control a class of uncertain systems. It is assumed that the plant to be controlled can be represented by its nominal and bounded parametric uncertainties. A robust sliding mode controller is newly derived so that the actual trajectory tracks the desired trajectory as closely as possible despite the non-linearities and input couplings present in the system. The Proportional-Integral sliding mode is chosen to ensure the stability of overall dynamics during the entire period i.e. the reaching phase and the sliding phase. The controller is applied to the control of a two-link planar robot manipulator as a case study.

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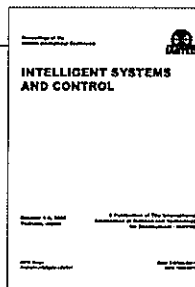
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