

Accepted Manuscript

Title: Adaptive sliding mode control with moving sliding surface

Author: Petr Hušek

PII: S1568-4946(16)00016-8

DOI: <http://dx.doi.org/doi:10.1016/j.asoc.2016.01.009>

Reference: ASOC 3412

To appear in: *Applied Soft Computing*

Received date: 12-5-2014

Revised date: 3-7-2015

Accepted date: 8-1-2016



Please cite this article as: Petr Hušek, Adaptive sliding mode control with moving sliding surface, *Applied Soft Computing Journal* (2016), <http://dx.doi.org/10.1016/j.asoc.2016.01.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Adaptive sliding mode control with moving sliding surface

Petr Hušek¹

Department of Control Engineering, Faculty of Electrical Engineering, Czech Technical University in Prague, Technická 2, 166 27, Prague 6, Czech Republic; phone: +420 22435 7336

Abstract

A continuous sliding mode control with moving sliding surface for nonlinear systems of arbitrary order is presented in this paper. The sliding surface is moved repetitively towards the target sliding surface in order to ensure that the system trajectory is close to the actual surface during the whole control process. The parameters of sliding mode control are tuned by a fuzzy logic. The proposed procedure reduces the time when the system operates in the approaching phase during which the control performance is deteriorated since the system is more susceptible to external disturbances and model uncertainties. The effectiveness of the presented approach is demonstrated on a control of a flexible robot manipulator arm.

Keywords: sliding mode control, fuzzy logic control, variable structure control

1. Introduction

Since its introduction sliding mode control (SMC) [1] has become one of the most popular approach to control of nonlinear systems. The main reason is its high robustness and easy design and implementation that have resulted in a big number of applications (see e.g. [2, 3, 4, 5, 6, 7]). The fundamental idea of SMC consists in transferring a nonlinear system to a

Email address: husek@fel.cvut.cz (Petr Hušek)

Download English Version:

<https://daneshyari.com/en/article/6904577>

Download Persian Version:

<https://daneshyari.com/article/6904577>

[Daneshyari.com](https://daneshyari.com)