

Ref: C 2 PF 251199/03 Df: 27745295
JOURNAL OF DYNAMIC SYSTEMS MEASURES & CO
01.12.00 Vol: 122 No. 4
0022-0434 22101144 09.01.01
LIBRIS - C2
144 BOULEVARD KRIM BELKACEM
ALGER
ALGERIE

JOURNAL OF DYNAMIC SYSTEMS, MEASUREMENT, AND CONTROL

Special Issue on Variable Structure Systems

Transactions of the ASME®

Dynamic Systems and
Control Division
Technical Editor, A. GALIP ULSOY

Past Editors, W. BOOK
M. TOMIZUKA
D. M. AUSLANDER
J. L. SHEARER
K. N. REID
Y. TAKAHASHI
M. J. RABINS

Associate Technical Editors,
A. ALLEYNE (2003)
Y. CHAIT (2002)
F. CONRAD (2001)
E. FAHRENTHOLD (2001)
S. FASSOIS (2001)
Y. HURMUZLU (2001)
R. LANGARI (2002)
E. MISAWA (2002)
S. NAIR (2001)
N. OLGAC (2001)
C. RAHN (2002)
S. SIVASHANKAR (2002)
J. TU (2002)
P. VOULGARIS (2001)

Book Review Editor
A. GALIP ULSOY

Executive Committee
Chairman, G. MASADA
Past Chairman, N. NATHOO
Vice Chairman, C. RADCLIFFE
Members, J. STEIN
S. JAYASURIYA
Secretary, C. DESILVA

BOARD ON COMMUNICATIONS
Chairman and Vice-President
R. K. SHAH

OFFICERS OF THE ASME
President, JOHN R. PARKER
Executive Director
D. L. BELDEN
Treasurer
J. A. MASON

PUBLISHING STAFF
Managing Director, Engineering
CHARLES W. BEARDSLEY
Director, Technical Publishing
PHILIP DI VIETRO
Managing Editor, Technical Publishing
CYNTHIA B. CLARK
Managing Editor, Transactions
CORNELIA MONAHAN
Production Assistant
MARISOL ANDINO

Transactions of the ASME, Journal of Dynamic Systems, Measurement, and Control (ISSN 0022-0434) is published quarterly (Mar., June, Sept., Dec.) by The American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to Transactions of the ASME, Journal of Dynamic Systems, Measurement, and Control, c/o THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300.

CHANGES OF ADDRESS must be received at Society headquarters seven weeks before they are to be effective. Please send old label and new address.

STATEMENT from By-Laws. The Society shall not be responsible for statements or opinions advanced in papers or ... printed in its publications (B7.1, Para. 3).

COPYRIGHT © 2000 by The American Society of Mechanical Engineers. Authorization to photocopy material for internal or personal use under those circumstances not falling within the fair use provisions of the Copyright Act, contact the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, tel: 978-750-8400, www.copyright.com. Request for special permission or bulk copying should be addressed to Reprints/Permission Department. Reprints from this publication may be made on condition that full credit be given to the author, and date of publication be stated.

INDEXED by Applied Mechanics Reviews and Engineering Information, Inc. Canadian Goods & Services Tax Registration #126148048.

Journal of Dynamic Systems, Measurement, and Control

Published Quarterly by The American Society of Mechanical Engineers

VOLUME 122 • NUMBER 4 • DECEMBER 2000

Special Issue on Variable Structure Systems

585 Editorial
Eduardo A. Misawa and Vadim Utkin

TECHNICAL PAPERS

586 Multiple Sliding Surface Control: Theory and Application
J. K. Hedrick and P. P. Yip

594 Real-Time Implementation of Sliding Mode Observer for Synchronous Rectification of the Automotive Electrical Power Supply System
De-Shiou Chen, Vadim I. Utkin, Shahram Zarei, and John M. Miller

599 Variable Structure Control of Engine Idle Speed With Estimation of Unmeasurable Disturbances
A. Stotsky, B. Egardt, and S. Eriksson

604 Simplex Based Sliding Mode Control of an Underwater Gripper
G. Bartolini, M. Coccoli, and E. Punta

611 Sliding Mode Friction Compensation for a 20 DOF Sensor Glove
Péter Korondi, Péter T. Szemes, and Hideki Hasimoto

616 Tracking and Regulation Control of a Mobile Robot System With Kinematic Disturbances: A Variable Structure-Like Approach
W. E. Dixon, D. M. Dawson, and E. Zengeroglu

624 A Learning Variable Structure Controller of a Flexible One-Link Manipulator
Wen-Jun Cao and Jian-Xin Xu

632 Sliding Mode Control of a Three Degrees of Freedom Anthropoid Robot by Driving the Controller Parameters to an Equivalent Regime
M. Onder Efe, Okyay Kaynak, and Xinghuo Yu

641 A Gain Scheduled Sliding Mode Control Scheme Using Filtering Techniques With Applications to Multilink Robotic Manipulators
Jian-Xin Xu, Ya-Jun Pan, and Tong-Heng Lee

650 A General Sliding Mode Controller for Nonlinear Chemical Processes
Oscar Camacho and Rubén Rojas

656 A Sliding Mode Static Output Feedback Controller Based on Linear Matrix Inequalities Applied to an Aircraft System
Christopher Edwards, Sarah K. Spurgeon, and Ashu Akoachere

663 Nonlinear Control for Missile Terminal Guidance
Der-Cherng Liaw, Yew-Wen Liang, and Chiz-Chung Cheng

669 Angular Velocity Stabilization of a Rigid Body Via VSS Control
T. Floquet, W. Perruquetti, and J.-P. Barbot

674 Sliding Mode Control of Nonlinear Mechanical Vibrations
Hebertt Sira-Ramírez and Orestes Llanes-Santiago

(Contents continued on inside back cover)

This journal is printed on acid-free paper, which exceeds the ANSI Z39.48-1992 specification for permanence of paper and library materials. ©™

♻️ 85% recycled content, including 10% post-consumer fibers.