

P O L I S H A C A D E M Y O F S C I E N C E S
COMMITTEE OF AUTOMATIC CONTROL AND ROBOTICS

ARCHIVES OF CONTROL SCIENCES

VOLUME 29 (LXV), No. 1

QUARTERLY

Institute of Automatic Control
Silesian University of Technology
Gliwice 2019

Archives of Control Sciences welcomes for consideration papers on topics of significance in broadly understood control science and related areas, including: basic control theory, optimal control, optimization methods, control of complex systems, mathematical modeling of dynamic and control systems, expert and decision support systems and diverse methods of knowledge modeling and representing uncertainty (by stochastic, set-valued, fuzzy or rough set methods, etc.), robotics and flexible manufacturing systems. Related areas that are covered include information technology, parallel and distributed computations, neural networks and mathematical biomedicine, mathematical economics, applied game theory, financial engineering, business informatics and other similar fields.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.

Submission of a paper implies the author's irrevocable and exclusive authorization of the publisher to collect any sums or considerations for copying or reproduction payable by third parties.

Copyright ©Silesian University of Technology, 2019

The publication of this Journal is supported by funds from the Polish Ministry of Science and Higher Education.

Address of the Editor: Institute of Automatic Control, Silesian University of Technology
Akademicka 16, 44-100 Gliwice, Poland. Tel: +(48-32) 237-23-98, fax +(48-32) 237-21-27

<http://acs.polsl.pl>

CONTENTS

D. Krokavec, A. Filasová: A new D-stability area for linear discrete-time systems	5
J. Brodny, M. Tutak: Forecasting the distribution of methane concentration levels in mine headings by means of model-based tests and in-situ measurements	25
A. Abdelhak, M. Rachik: Model reduction problem of linear discrete systems: Admissibles initial states	41
A.Zh. Khurshudyan: Distributed controllability of one-dimensional heat equation in unbounded domains: The Green's function approach	57
V.-T. Pham, S. Vaidyanathan, C. Volos, S. Jafari, F.E. Alsaadi, F.E. Alsaadi: Chaos in a simple snap system with only one nonlinearity, its adaptive control and real circuit design	73
R. Czyba, L. Stajer: Dynamic Contraction Method approach to digital longitudinal aircraft flight controller design	97
M. Szumowski, M.S. Żurawska, T. Zielińska: Preview Control applied for humanoid robot motion generation	111
N.A. Almohammadi, E.O. Alzahrani, M.M. El-Dessoky: Combined modified function projective synchronization of different systems through adaptive control	133
L. Yulianti, A. Nazra, Zulakmal, A. Bahar, Muhafzan: On discounted LQR control problem for disturbed singular system	147
T. Kaczorek: Absolute stability of a class of positive nonlinear continuous-time and discrete-time systems	157
I. Ullah, H.-L. Pei: Sliding mode tracking control for unmanned helicopter using extended disturbance observer	169