

IFAC Workshop on Networked and Autonomous Air and Space Systems (NAASS 2018)

IFAC PapersOnline Volume 51, Issue 12

Santa Fe, New Mexico, USA
13 – 15 June 2018

Editor:

Inseok Hwang

ISBN: 978-1-5108-7077-2

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2018) by IFAC (International Federation of Automatic Control)
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact the publisher, Elsevier Limited
at the address below.

Elsevier Limited
360 Park Ave South
New York, NY 10010

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

CONTINUOUS FIXED-TIME SLIDING MODE CONTROL FOR SPACECRAFT WITH FLEXIBLE APPENDAGES	1
<i>C. Ton, C. Petersen</i>	
A PREDICTIVE GUIDANCE ALGORITHM FOR AUTONOMOUS ASTEROID SOFT LANDING	6
<i>Julio C. Sanchez, Francisco Gavilan, Rafael Vazquez</i>	
MODEL PREDICTIVE CONTROL FOR CONTINUOUS LOW THRUST SATELLITE FORMATION FLYING	12
<i>Julian Scharnagl, Panayiotis Kremmydas, Klaus Schilling</i>	
COORDINATION AND CONSENSUS OVER NETWORKS: A RISK-AVERSE PROTOCOL	18
<i>Khanh D. Pham</i>	
DISTRIBUTED CONSENSUS CUBATURE INFORMATION FUSION IN SATURATED INERTIAL SENSORS NETWORK	26
<i>H. Benzerrouk, A. Nebylov, V. Nebylov</i>	
INTERACTIVE MULTIPLE MODEL TARGET TRACKING BASED ON SEVENTH-DEGREE SPHERICAL SIMPLEX-RADIAL CUBATURE INFORMATION FILTER	32
<i>H. Benzerrouk, A. Nebylov</i>	
COOPERATIVE AERIAL LOAD TRANSPORT WITH FORCE CONTROL	38
<i>Sandesh Thapa, He Bai, J.á. Acosta</i>	
DENSITY-BASED FEEDBACK CONTROL FOR EARTH ORBITING SWARMS VIA VELOCITY FIELDS	44
<i>Utku Eren, Nazli Demirer, Behçet Açiknese</i>	
SAFETY BUBBLE CONTROL FOR COORDINATION OF MULTIPLE UNMANNED AIRCRAFT SYSTEMS	50
<i>Pablo Rangel, Luis Rodolfo Garcia Carrillo</i>	
COOPERATIVE CONTROL FOR MULTIPLE INTERCEPTORS TO MAXIMIZE COLLATERAL DAMAGE	56
<i>Chang-Hun Lee, Antonios Tsourdos</i>	
A COMPARATIVE STUDY OF GAME-THEORETICAL AND MARKOV-CHAIN-BASED APPROACHES TO DIVISION OF LABOUR IN A ROBOTIC SWARM	62
<i>Inmo Jang, Hyo-Sang Shin, Antonios Tsourdos</i>	
CONTROL OF A GROUP OF LOW-FLYING VEHICLES NEAR THE WAVED SEA SURFACE IN ORDER TO MINIMIZE THEIR AVERAGE ALTITUDE	69
<i>H. Benzerrouk, A. Knyazhsky, A. Nebylov, V. Nebylov</i>	
CONCURRENT GOAL ASSIGNMENT AND COLLISION-FREE TRAJECTORY GENERATION FOR MULTIPLE AERIAL ROBOTS	75
<i>Benjamin Gravell, Tyler Summers</i>	
ADAPTIVE EVENT-TRIGGERED COOPERATIVE CONTROL OF UNCERTAIN NETWORKED SYSTEMS	82
<i>Eloy Garcia, Isaac Weintraub, David W. Casbeer</i>	
ROBUST HYBRID SUPERVISORY CONTROL FOR A 3-DOF SPACECRAFT IN CLOSE-PROXIMITY OPERATIONS	88
<i>Giulia Zucchini, Bharani P. Malladi, Ricardo G. Sanfelice, Eric A. Butcher</i>	
HYBRID CONTROL FOR AUTONOMOUS SPACECRAFT RENDEZVOUS PROXIMITY OPERATIONS AND DOCKING	94
<i>Jason R. Crane, Christopher W. T. Roscoe, Bharani P. Malladi, Giulia Zucchini, E. Butcher, R. Sanfelice, Islam I. Hussein</i>	
VERIFICATION OF THE RELATIVE DISTANCE MEASUREMENT METHOD FOR PICO-SATELLITES IN CONSTELLATION	100
<i>A. Nebylov, A. Medina Padron, A. Knyazhsky</i>	
OPTIMAL CONFIGURATIONS IN COVERAGE CONTROL WITH POLYNOMIAL COSTS	106
<i>Shaunak D. Bopardikar, Dhagash Mehta, Jonathan D. Hauenstein</i>	
REVIEW OF MULTI-AGENT ALGORITHMS FOR COLLECTIVE BEHAVIOR: A STRUCTURAL TAXONOMY	112
<i>Federico Rossi, Saptarshi Bandyopadhyay, Michael Wolf, Marco Pavone</i>	
A FLATNESS-BASED TRAJECTORY PLANNING ALGORITHM FOR RENDEZVOUS OF SINGLE-THRUSTER SPACECRAFT	118
<i>Julio C. Sanchez, Francisco Gavilan, Rafael Vazquez, Christophe Louembet</i>	

SINGULAR PERTURBATION CONTROL FOR THE LONGITUDINAL AND LATERAL-DIRECTIONAL FLIGHT DYNAMICS OF A UAV	124
<i>L. Garcia-Baquero, S. Esteban, G. V. Raffo</i>	
AN ADAPTIVE ARCHITECTURE FOR CONTROL OF UNCERTAIN DYNAMICAL SYSTEMS WITH UNKNOWN ACTUATOR BANDWIDTHS	130
<i>Benjamin C. Gruenwald, Tansel Yucelen, K. Merve Dogan, Jonathan A. Muse</i>	
OPTIMAL TRADE-OFF ANALYSIS FOR EFFICIENCY AND SAFETY IN THE SPACECRAFT RENDEZVOUS AND DOCKING PROBLEM	136
<i>Abraham P. Vinod, Meeko M. K. Oishi</i>	
UNDER-APPROXIMATING REACH-AVOID SETS FOR SPACE VEHICLE MANEUVERING IN THE PRESENCE OF DEBRIS	142
<i>Matt Shubert, Meeko Oishi, Morgan Baldwin, R. Scott Erwin</i>	
Author Index	