AIAA Guidance, Navigation, and Control Conference 2010

Toronto, Ontario, Canada
2-5 August 2010

Volume 1 of 9

ISBN: 978-1-61782-331-2

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.

The contents of this work are copyrighted and additional reproduction in whole or in part are expressly prohibited without the prior written permission of the Publisher or copyright holder. The resale of the entire proceeding as received from CURRAN is permitted.

For reprint permission, please contact AIAA's Business Manager, Technical Papers. Contact by phone at 703-264-7500; fax at 703-264-7551 or by mail at 1801 Alexander Bell Drive, Reston, VA 20191, USA.

TABLE OF CONTENTS

VOLUME 1

Positive Invariance Set of L_1 Adaptive Controller in the Presence of Input Saturation 1
Dapeng Li, Naira Hovakimyan, Chengyu Cao

Comparative Analysis of MRAC Architectures in a Unified Framework 14
Thomas Bierling, Florian Holzapfel, Andreas Wildschek, Rudolf Maier, Leonhard Hocht

Adaptive Control of Nonlinear Systems with Unknown Delays and Persistent Disturbances 37
Mark Balas

Adaptive Output Feedback Design Using Asymptotic Properties of LQG / LTR Controllers 49
Eugene Lavretsky

K-Modification Based H_2 Adaptive Control 67
Kilsoo Kim, Tansel Yucelen, Anthony Calise

Concurrent Learning for Improved Convergence in Adaptive Flight Control 84
Girish Chowdhary, Eric Johnson

Analysis of Air Traffic Controller Workload Reduction Based on the Solution Space for the Merging Task 103
Gustavo Mercado-Velasco, Max Mulder, Marinus Van Paassen

The Use of the Dynamic Solution Space to Assess Air Traffic Controller Workload 121
Jurriaan D'Engelbronner, Max Mulder, Marinus Van Paassen, Sebastiaan De Stigter, H. Huisman

Safety Analysis of the Advanced Airspace Concept Using Monte Carlo Simulation 142
David Blum, David Thipphavong, Tamika Rentas, Ye He, Xi Wang, Elisabeth Pate-Cornell

Time-of-Arrival Based Taxi Conformance Monitoring for Surface Operation 161
Qian Zheng, Yiyuan Zhao, Brian Capozzi

Controller-Managed Spacing – A Human-in-the-Loop Simulation of Terminal-Area Operations 188
Michael Kupfer, Everett Palmer, Todd J. Callantine, Joey Mercer, Lynne Martin

Automatic Recovery and Autonomous Navigation of Disabled Aircraft After Control Surface Actuator Jam 201
Cosku Kasnakoglu, Unver Kaynak

Development of Adaptive Control Laws for Actuator Fault Accommodation 222
Daniele Tancredi, Yu Gu, Kerri Phillips, Srikanth Gururajan, Marcello Napolitano

Enhancing UAV Survivability Through Damage Tolerant Control 242
Damien Jourdan, Mike Piedmonte, Vlad Gavrilets, David Vos, Jim McCormick

Adaptive Control of a Damaged Transport Aircraft Using M-MRAC 268
Vahram Stepanyan, Stefan Campbell, Kalmanje Krishnakumar

Near Optimal Tracking Solution for Input Constrained UAV Using MPC 287
Jian Liang Wang, Eng Kee Poh, Keck Voon Ling

Smooth Transitions for a Turning Dubins Vehicle 298
Heejun Choi, Ella Atkins

Open-Loop Stability of Flapping Flight in Hover 316
Michael Bolender

Flapping Wing Micro-Air-Vehicle Control, Employing Triangular Wave Strokes and Cycle-Averaging 334
David Sigthorsson, Michael Oppenheimer, David Doman

Flapping Wing Micro-Air-Vehicle 4-DOF Controller Applied to a 6-DOF Model 357
David Sigthorsson, Michael Oppenheimer, David Doman

Techniques for Non-Harmonic Wing Flapping for the Control of Micro Air Vehicles 374
Michael Anderson, Richard Cobb

Modeling and Control Design for a Flapping-Wing Nano Air Vehicle 387
Jason Geder, Ravi Ramamurti, William Sandberg, Anita Flynn

Multiple Degree-of-Freedom Control of a Flapping-Wing Micro Air Vehicle with Power and Control Actuators 402
Michael Oppenheimer, David Sigthorsson, David Doman

Managing Cassini Attitude Control During Safe Mode at Saturn 432
Thomas Burk

Cassini Spacecraft In-Flight Swap to Backup Attitude Control Thrusters 447
David Bates

Y-Biasing: A New Operational Method for Cassini to Control Thruster Usage While Managing Reaction Wheel Momentum 456
Todd Brown

Cassini Attitude Control Fault Protection: Flight Operations Strategy Changes for Saturn Extended Mission 466
Lauren Cooney

A Flight-Calibrated Methodology for Determination of Cassini Thruster On-Times for Reaction Wheel Biases 479
Siamak Sarani

Estimation and Modeling of Enceladus Plume Jet Density Using Reaction Wheel Control Data 502
Allan Lee, Eric K. Wang, Emily B. Pilinski, Glenn A. Macala, Antonette Feldman

Unified GN&C System for the Space Rapid Transit Launch Vehicle 528
Joseph Mueller, Paul Griesemer, Michael Paluszek, Jingwen Du

Flexible Modes Control Using Sliding Mode Observers: Application to ARES I 553
Yuri Shtessel, Charles Hall, Simon Baev, Jeb S. Orr

H-∞ Norm Minimization Approach for Adaptive Control of the Crew Launch Vehicle 575
Jonathan Muse, Anthony Calise
A Gain Scheduled H-Infinity Controller for a Reentry Benchmark 599
Andres Marcos
Sampling-Based Roadmap Methods for a Visual Reconnaissance UAV 614
Karl Obermeyer, Paul Oberlin, Swaroop Darbha
Motion Estimation for Obstacle Detection and Avoidance Using a Single Camera for UAVs/Robots 635
Syed Shah, Eric Johnson, Suresh Kannan
Optimal UAV Flights for Seeability and Endurance in Fields 649
Wei Guo, Yiyuan Zhao, Brian Capozzi
Optimization of The Motion of a Mobile Gateway to Improve Connectivity in a Network of Autonomous Underwater Vehicles 681
Camila Francolin, Christiane Duarte, Gerald Martel, Anil Rao
Avionics to Enable UAS Integration into the NextGen ATS 701
Rosa Weber, Eric Euteneuer
Flight Test Results for Kalman Filter and H_2 Modification in Adaptive Control 716
Rajeev Chandramohan, Tansel Yucelen, Anthony Calise, Girish Chowdhary, Eric Johnson
Combined/Composite Adaptive Control of a Quadrotor UAV in the Presence of Actuator Uncertainty 725
Zachary Dydek, Anuradha Annaswamy, Eugene Lavretsky
Adaptive Control for Time Delay Systems Applied to Flight Control 735
Yildiray Yildiz
Investigation of Cumulative Retrospective Cost Adaptive Control for Missile Application 744
Robert Fuentes, Jesse Hoagg, Blake Anderton, Anthony M. D'Amato, Dennis S. Bernstein
Interceptor Missile Control – A New Look at Boost and Midcourse 757
David Foreman, Christian Tournes, Yuri Shtessel
Robust Control of a Nonlinear, Non-Minimum Phase Supersonic Flight Vehicle Based on Stable System Center 782
Behrouz Ebrahimi, M. Bahrami, M. M. Asadi
Multivehicle Spacing Along Smooth Curvilinear Paths 791
Lesley Weitz, John Hurtado
Kripke Modeling and Model Checking of a Multiple UAV System Monitoring Road Network 802
Gopinadh Sirigineedi, Antonios Tsourdos, Brian White, Rafal Zbikowski
On Coordinated Road Search Using Time-Coordinated Path Following of Multiple UAVs 813
Vladimir Dobrokhodov, Isaac Kaminer, Kevin Jones, Enric Xargay, Zhiyuan Li, Naira Hovakimyan, A. P. Aguiar, A. M. Pascoal
Pursuit and Evasion: Evolutionary Dynamics and Collective Motion 823
Darren Pais, Naomi Leonard
Multi-Vehicle Coordination in an Unknown Flowfield 837
Cammy Peterson, Derek Paley
Actor-Critic Policy Learning in Cooperative Planning 857
Joshua Redding, Alborz Geramifard, Han-Lim Choi, Jonathan How
Real-Time Performance of Pursuer Seeker Estimator 869
P. K. Kar, T. Srinivasan, A. K. Sarkar, Radhakant Padhi
Sparse Gauss-Hermite Quadrature Filter for Orbit Estimation 884
Bin Jia, Ming Xin, Yang Cheng
Motion Models for Use with the Maneuvering Ballistic Missile Tracking Estimators 894
Jinwhan Kim, Padmanabhan Menon, Ernest Ohlmeyer

VOLUME 2

Nonlinear Estimation of Hypersonic Flight Using Polynomial Chaos 907
Parikshit Dutta, Raktim Bhattacharya
Characteristic Function Approach for Estimation of Scalar Systems with Cauchy Noises 919
Moshe Idan, Jason Speyer
Safe Guidance for Autonomous Rendezvous and Docking with a Non-Cooperative Target 943
Dawei Zhang, Shenmin Song, Run Pei
Relative Motion and Autonomous Rendezvous in Keplerian Elliptic Orbits 962
Mohamed Okasha, Brett Newman
Rendezvous-Phasing Errors Propagation Using Quasi-linearization Method 976
Li-Bo Liang, Ya-Zhong Luo, Jin Zhang, Hai-Yang Li, Guo-Jin Tang
Mixed Iterative Algorithm for Solving Optimal Impulsive Time-Fixed Rendezvous Problem 989
Mounir Kara Zaitri, Denis Arzelier, Christophe Louembet
Optimization of Spacecraft Rendezvous and Docking Using Interval Analysis 1008
Erik-Jan Van Kampen, Q. P. Chu, Bob Mulder
Evaluation of Autonomous Guidance Techniques for Space Rendezvous and Withdrawal Strategy 1031
Pierre Blanc-Paques, Emmanuel Gogibus, Christophe Louembet, Mounir Kara-Zaitri
Strategy of Magnetometer Calibration for Nano-Satellite Missions and In-Orbit Performance 1050
Takaya Inamori, Nobutada Sako, Shinichi Nakasuka
Surface Mounted Flow State Estimators for Reduced Order POD Models: Shear Layer 1063
Casey Fagley, Mark Balas, Jurgen Seidel, Stefan Siegel, Thomas McLaughlin

Analysis of an Extended Kalman Filter-Based Orbit Determination System 1074
Quang Lam, Daniel Junker, David Anhalt, David Vallado
Maturing Vision-Based Navigation Solutions to Space Exploration 1092
Grégory Flandin, Bernard Polle, Noela Despré, Jacques Lheritier, Nicolas Perrimon, Pierre Blanc-Paques
Automated Rendezvous & Capture In-Orbit Using a 3-D Vision System 1108
Farhad Aghili
Super-Integrability in the Unperturbed Relative Orbital Motion Problem 1119
Daniel Condurache, Vladimir Martinusi
L_1 Adaptive Control Augmentation System with Application to the X-29 Lateral/Directional Dynamics: A Multi-Input Multi-Output Approach 1128
Brian Griffin, John Burken, Enric Xargay
Input and Output Performance of M-MRAC in the Presence of Bounded Disturbances 1142
Vahram Stepanyan, Krishnakumar Kalmanje
An Adaptive LQ-Based Control Design with Parameter Projection Applied to the NASA GTM 1163
Jiaxing Guo, Shalaka Narkhede, Gang Tao
Immersion and Invariance Based Nonlinear Adaptive Flight Control 1174
Lars Sonneveldt, Eduard Van Oort, Q. Chu, J. Mulder
Development of Verification and Validation Approaches for L_1 Adaptive Control: Multi-Criteria Optimization for Filter Design 1192
Naira Hovakimyan, Kwang Ki Kim
A Mixed Integer Linear Program for Solving a Multiple Route Taxi Scheduling Problem 1208
Justin Montoya, Zachary Wood, Sivakumar Rathina, Waqar Malik
Airport Gate Assignment that Minimizes Passenger Flow in Terminals and Aircraft Congestion on Ramps 1226
Sang Hyun Kim, Eric Feron, John-Paul Clarke
Design and Pilot Evaluation of a Runway Conflict Detecting and Alerting System 1239
A. Sammut, B. Zammit, M. A. Azzopardi, D. Zammit-Magion, S. Szasz
Incorporating Active Runway Crossings in Airport Departure Scheduling 1261
Gautam Gupta, Waqar Malik, Yoon Jung
Managing Departure Aircraft Release for Efficient Airport Surface Operations 1272
Waqar Malik, Gautam Gupta, Yoon Jung
A Stochastic Model of Runway Configuration Planning 1287
Leihong Li, John-Paul Clarke
Impact of Arrivals on Departure Taxi Operations at Airports 1304
Regina Clewlow, Ioannis Simaiakis, Hamsa Balakrishnan
Runway Assignment by Minimizing Emissions in Terminal Airspace 1325
Bosung Kim, Leihong Li, John-Paul Clarke
Sliding Mode Reconfigurable Control with Application to Longitudinal Control of Boeing 747 1338
Tao Wang, Wenfang Xie, Youmin Zhang
Investigation of Practical Flight Envelope Protection Systems for Small Aircraft 1347
Wouter Falkena, Clark Borst, J. A. Mulder
Robust Landing Guidance Law for Impaired Aircraft 1360
P. K. Menon, S. S. Vaddi, P. Sengupta
Actuator Fault Diagnosis Using Two-Stage Extended Kalman Filters 1388
Matthew Ruschmann, N. Eva Wu, Jong-Yeob Shin
Reference Management for Fault-Tolerant Model Predictive Control 1409
Fabio Almeida
Robust Control of PVTOL Aircraft with a Nonlinear Optimal Control Solution 1429
Ming Xin, Hejia Pan
Model-Based Predictive Control of Insect-Like Flapping Wing Aerial Micro-Robot 1447
Alborz Sakhaei, Guangjun Liu
Four Wing Flapping Micro Air Vehicles - Dragonflies or X-Wings? 1457
Christopher Orlowski, Anouck Girard, Wei Shyy
Analysis of the Translational Motion of a Flapping Wing Micro Air Vehicle 1477
Michael Oppenheimer, David Sigthorsson, Michael A. Bolender, David B. Doman
Robust Control of a 3-DOF Flapping Wing Micro Air Vehicle 1503
Andrea Serrani, Benjamin Keller, Michael Bolender, David Doman
Reduced Input Control of an Underactuated Satellite Formation 1517
Geoffrey McVittie, Krishna Dev Kumar, Guangjun Liu
Performance Assessment of the Drag-Based Formation Control for the JC2Sat Mission 1537
Jean-François Hamel, Jean De Laontaine, Casey Lambert, Alfred Ng
Quaternion-Based Attitude Synchronization and Tracking for Spacecraft Formation Subject to Sensor and Actuator Constraints 1560
Ali Reza Mehrabian, S. Tafazoli, K. Khorasani
Analytical Solutions to Formation Flying System Trajectory Guidance via the Virtual Motion Camouflage Approach 1581
Yunjun Xu
Collision Avoidance Control for Formation Flying Satellites 1600
Hu Min, Zeng Guoqiang, Song Junling

Relative Position and Attitude Coupling Control of Sun-Earth L_2 Point Formation Flying by QLTV Polynomial Eigenstructure Assignment 1609
Feng Wang, Antonios Tsourdos, Rafal Zbikowski, Brian White, Finn Ankersen, Adrian Stanley

Overview of a Preliminary Design of the Guidance, Navigation, and Control Subsystem of the Lunar Lander Altair 1623
Allan Lee, Todd Ely Ronald Sostaric, Alan Strahan, Joseph E. Riedel, Mitch Ingham, James Wincentsen, Siamak Sarani

Altair Navigation During Trans-Lunar Cruise, Lunar Orbit, Descent and Landing 1684
Todd Ely, Martin Heyne, Joseph E. Riedel

Optical Navigation Plan and Strategy for the Lunar Lander Altair 1717
J. Riedel, Andrew T. Vaughan, Robert A. Werner, Tseng-Chan Wang, Simon Nolet, David M. Mjyers, Nickolaos Mastrodemos, Allan Y. Lee, Christopher Grasso, Todd A. Ely, David S. Bayard

Altair Descent and Ascent Reference Trajectory Design and Initial Dispersion Analyses 1757
Larry Kos, Tara P. Polsgrove, Ronald R. Sostaric, Ellen M. Braden, Jacob J. Sullivan, Thanh T. Le

Preliminary Characterization of the Altair Lunar Lander Slosh Dynamics and Some Implications for the Thrust Vector Control Design 1768
Alan Strahan, Alan Strahan, Rebekah Tanimoto, Arturo Casillas

Terrain Hazard Detection and Avoidance During the Descent and Landing Phase of the Lunar Lander Altair Mission 1802
Alan Strahan, Andrew E. Johnson

VOLUME 3

Rendezvous and Docking Sensor and Effector System Design for the Lunar Lander Altair 1822
Jake Sullivan, Allan Y. Lee, Myron R. Grover

Launch Vehicle Attitude Control Using Higher-Order Sliding Modes 1848
James Stott, Yuri Shtessel

Low-Order Aeroelastic Model of Launch-Vehicle Dynamics 1862
Andrew Sinclair, George Flowers

High-Accuracy Moon to Earth Escape Trajectory Optimization 1872
Hui Yan, Qi Gong, Chan Park, Michael Ross, Christopher N. D'Souza

A Simple Strategy for Computing Time Optimal Earth-Return Trajectories for Lunar and Cislunar Flight 1893
Shane Robinson, David Geller, Jessica Anderson

Reactive Obstacle Avoidance of UAVs with Dynamic Inversion-Based Partial-Integrated Guidance and Control 1913
Radhakant Padhi, Charu Chawla

Anticipation as a Method for Overcoming Time Delay in Control of Remote Systems 1938
Mark McClelland, Mark Campbell

A Cross-Entropy Based Approach for UAV Task Allocation with Nonlinear Reward 1947
Aditya Undurti, Jonathan How

Autonomous Collision Avoidance for Mini UAV: Flying Through Mountain Corridor for Disaster Monitoring 1963
Midori Maki, Kazutoshi Ishikawa

An Autonomous Recovery System for a Rotorcraft UAV Operating in Rough Seas 1971
Xilin Yang, Hemanshu Pota, Matt Garratt

Anti-Crosswind Autolanding of UAVs Based on Active Disturbance Rejection Control 1995
Hua Xiong, Jian-Qiang Yi, Guo-Liang Fan, Feng-Shui Jing

Integral Backstepping Control of an Unmanned, Unstable, Fin-Less Airship 2009
Torsten Liesk

Modeling, Control, and Failure Stabilization of a Modified F-15: A Takagi-Sugeno Fuzzy Model Based Approach 2025
Evan Butler, Hua Wang, John Burken

Use of Neural Network Approximation for Trajectory Optimization of Unmanned Aerial Vehicles with Gimbaled Cameras 2048
Eric Schmidt, Joseph Horn, Brian Geiger

An Online Nonlinear Optimal Controller Synthesis for Aircraft with Model Uncertainties 2066
Sivasubramanya Balakrishnan, Jie Ding

Robust Adaptive Disturbance Compensation for Ship-Based Rotorcraft 2085
Jared Cooper, Joseph Horn, John Schierman

Development of a Detection Scheme for Aircraft Engine Failures Based on the Artificial Immune System Paradigm 2106
Mario Perhinschi, Jaclyn Porter, Hever Moncayo, Jennifer Davis, Scott Wayne

Sliding Mode Integrated Missile Guidance and Control 2131
Nathan Harl, S. Balakrishnan, Craig Phillips

Generic Analysis of Interceptor Design and Tracking System Performance for Boost Phase Intercept 2149
Ernest Ohlmeyer, S. Balakrishnan

Robust Performance Analysis of Hybrid Guidance Loop Models 2172
Martin Weiss, Domenic Bucco

Nonlinear Control of an Air-Breathing Engine: A Practical Approach Using Dynamic Inversion and EKF 2182
Radhakant Padhi, Arnab Maity, Jagannath Rajasekaran

Realtime Agile-Turn Guidance and Control for an Air-to-Air Missile 2207
K. Kim, Seonhyeok Kang, H. Jin Kim, Chang-Hun Lee, Min-Jea Tahk

Gaussian Mixture Approximation by Another Gaussian Mixture for 'Blob' Filter Re-Sampling 2226
Mark Psiaki, Jonathan Schoenberg, Isaac Miller
Extended Kalman Filter and Sigma Point Filter Approaches to Adaptive Filtering 2253
James Forbes
Universal Sea Target Tracking with Angle-Only Measurements 2268
Andrew Douglas, Michael T. Grabbe
A Particle Filter Approach to WiFi Target Localization 2287
Neeti Wagle, Eric Frew
A Real-Time Sliding Window Filter for Projectile Attitude Estimation 2299
Bertrand Grandvallet, Ali Zemouche, Mohamed Boutayeb, Sebastien Changey
On the Consider Kalman Filter 2313
Drew Woodbury, John Junkins
Capture of Spinning Target with Space Manipulator Using Magneto Rheological Damper 2341
Thai Chau Nguyen Huynh, Inna Sharf
Optimal Guidance and Thruster Control in Orbital Approach and Rendezvous for Docking Using Model Predictive Control 2353
Leena Singh, Simone Bortolami, Lance Page
Viability of Angles-Only Navigation for Orbital Rendezvous Operation 2368
Jason Schmidt, David Geller, Frank Chavez
Spacecraft Proximity Navigation and Autonomous Assembly based on Augmented State Estimation: Analysis and Experiments 2393
Veronica Pellegrini, Riccardo Bevilacqua, Marcello Romano, Fabio Curti
Unconventional Integrated Navigation Systems Based on Redundancy of Traditional Navigation Sensors 2412
Vincenzo Baraniello, Federico Corraro
A Systematic Approach for Extended Kalman Filter Tuning and Low-Cost Inertial Sensor Calibration Within a GPS/INS Application 2434
Jason Gross, Yu Gu, Marcello Napolitano
Minimal Sensor Scanning Volumes for Helicopter Terrain Avoidance 2454
Colin Greatwood, Arthur Richards
Communication Characterization for a ZigBee Based Airborne Wireless Sensor Network 2462
Apratim Shaw, Kamran Mohseni
Guidance, Navigation and Control (GNC) at the Faculty of Aerospace Engineering of the Technion – Israel Institute of Technology 2472
Joseph Ben Asher
Some Research Topics and Projects at HIT (China) 2476
Yu Yao, Fenghua He
The Contribution of GNC R&D activities for the Space Development Programs in Korea 2480
Sang-Ryool Lee
Overview of Japan Canada Joint Collaboration Satellites (JC2Sat) GNC Challenges and Design 2494
Anton De Ruiter, James Lee, Alfred Ng, Casey Lambert, Jean-Francois Hamel, Jean De Lafontaine, Balaji Shankar
Derivative-Free Model Reference Adaptive Control 2516
Tansel Yucelen, Anthony Calise
Adaptive Control in the Presence of Rate Saturation with Application to a Transport Aircraft Model 2533
Megumi Matsutani, Anuradha Annaswamy, Luis Crespo
Adaptive Control Allocation in the Presence of Actuator Failures 2548
Yu Liu, Luis Crespo
L_1 Adaptive Flight Control System: Systematic Design and Verification and Validation of Control Metrics 2568
Enric Xargay, Naira Hovakimyan, Vladimir Dobrokhodov, Roman B. Statnikov, Isaac Kaminer, Chengyu Cao, Irene M. Gregory
Alternative Model Reference Adaptive Control 2602
Eugene Lavretsky, Jason Levin, Ross Gadient
L_1 Adaptive Control under Anomaly: Flying Qualities and Adverse Pilot Interaction 2614
Ronald Choe, Enric Xargay, Naira Hovakimyan, Chengyu Cao, Irene M. Gregory
Direct Model Reference Adaptive Control of a Flexible Joint Robot 2643
Steve Ulrich, Jurek Sasiadek
N-Body Flexible Dynamics of the Space Station During Module Redocking via Manipulator System 2653
Yu Yao, Jian Guo, Hui Zhao, Tun Liu
Cartesian Control of Space Manipulators for On-Orbit Servicing 2675
Farhad Aghili
Camera-Aided Navigation Sensor for Unmanned Blimp with Low Trajectory Dynamics 2686
Martin Fach, Klaus Well, Uwe Salomon, Florian Weimer
Dynamically Sized Occupancy Grids for Obstacle Avoidance 2695
Sean Marlow, Jack Langelaan
Prediction and Use of Contrail Frequency Index for Contrail Reduction Strategies 2716
Neil Chen, Banavar Sridhar, Hok Ng

VOLUME 4

Predicting Peak Sector Occupancy with Two-Hour Convective Weather Forecasts 2727
Shawn Wolfe, Deepak Kulkarni

Comparison of the Performance of Two Aggregate Air Traffic Models 2741
Yi Cao, Dengfeng Sun
A Framework for Stochastic Air Traffic Flow Modeling and Analysis 2755
Padmanabhan Menon, Monish Tandale, Jinwhan Kim, Prasenjit Sengupta
Discrete-Event Simulation of Air Traffic Flow 2783
Matthew Jardin, David Manegold, Anuja Apte
Three Stage In-Flight Alignment with Covariance Shaping Adaptive Filter for the Strap-Down Inertial Navigation System (SDINS) 2798
Wooneson Hong, Kyung-Jun Han, Chulsoo Lee, Boksoo Paik
Fault Detection and Fail-Safe Operation with a Multiple-Redundancy Air-Data System 2808
Ryan Eubank, Ella Atkins, Stephanie Ogura
Robust Thrust-Only Control of Damaged Aircraft with Horizontal Tail Loss 2822
Yoshitsugu Hitachi, Hugh Liu
Full Envelope Modular Adaptive Control of a Fighter Aircraft Using Orthogonal Least Squares 2847
Eduard Van Oort, Lars Sonnveldt, Qu-Ping Chu, J. Mulder
Model Identification and Active Modeling Control for Small-Size Unmanned Helicopters: Theory and Experiment 2867
Dalei Song, Jungtong Qi, Jianda Han
Piloted Simulator Evaluation Results of New Fault-Tolerant Flight Control Algorithm 2888
Thomas Lombaerts, Hafid Smaili, O. Stroosma, Q. P. Chu, J. A. Mulder, D. A. Joosten
Open-Loop Reference Models for Nonlinear Control with Applications to Unmanned Helicopter Flight 2913
Sven Lorenz
Experimental Evaluation of Derivative Free Model Reference Adaptive Control 2933
Rajeev Chandramohan, Tansel Yucelen, Anthony Calise, Girish Chowdhary, Eric Johnson
Developing Operator Models for UAV Search Scheduling 2940
Luca Bertuccelli, Mary Cummings, N. W. M. Beckers
Optimal Observation of Satellites Using Combined Measurements from Many Networked Observers Cooperatively Controlled by Human and Autonomous Means 2955
John McInroy, Lawrence Robertson
Combining Planning and Learning for Autonomous Vehicle Navigation 2969
Arthur Richards, Patrick Boyle
Stochastic Reachable-Set Policies for Aircraft Upset Reconfiguration Problems with Time-Scale Separation 2978
Jonathan De Castro, Liang Tang, Kenneth Loparo
Neuro-Fuzzy Dynamic Inversion Control for a Hypersonic Cruise Vehicle 2991
Hussein Youssef, Brian Holm-Hansen, Howard P. Lee
Neural Network Based Adaptive Control with Hierarchy-Structured Dynamic Inversion Applied to Nonlinear Aircraft Model 3004
Tetsujiro Ninomiya, Yoshikazu Miyazawa
Quadrocopter Ground Effect Compensation with Sliding Mode Control 3013
Alexander Joos, Andy Haefner, Florian Weimer, Walter Fichter
Trajectory Control of Miniature Helicopters Using a Unified Nonlinear Optimal Control Technique 3022
Ming Xin, Yunjun Xu, Ricky Hopkins
Hover Stabilization of a Controllable Mechanical Samara 3046
Steven Gerardi, Evan Ulrich, J. Sean Humbert, Darryll Pines
Continuous Local Motion Planning and Control for Micro-Air-Vehicles in Complex Environments 3057
Andrew Berry, Jeremy Howitt, Da-Wei Gu, Ian Postlethwaite
Optimal Intercept Missile Guidance Strategies with Autopilot Lag 3073
Robert Chen, Jason Speyer, Dimitrios Lianos
Triangle Intercept Guidance for Aerial Defense 3092
Takeshi Yamasaki, S. Balakrishnan
Line of Sight Guidance for Defending an Aircraft 3114
Ashwini Ratnoo, Tal Shima
Cooperative Differential Games Strategies for Active Aircraft Protection from a Homing Missile 3136
Andrey Perelman, Tal Shima, Ilan Rusnak
Aerial Pursuit-Evasion Game Using Nonlinear Model Predictive Guidance 3158
Seonhyeok Kang, H. Jin Kim, Min-Jea Tahk
Particle Filter for Ballistic Target Tracking with Glint Noise 3170
Jinwhan Kim, Monish Tandale, Padmanabhan Menon, Ernest Ohlmeyer
Kinodynamic Motion Planning for Holonomic UAVs in Complex 3-D Environments 3182
Peiyi Chen, Steven Waslander
Fault Detection and Diagnosis for GTM UAV with Dual Unscented Kalman Filter 3204
Ling Ma, Youmin Zhang
Relative Orbital Element Estimation and Observability Analysis for Formation Flying Satellites Using Inter-Satellite Range Measurements Only 3216
Daan Maessen, Eberhard Gill
Representing Substantial Heading Uncertainty for Accurate Geolocation by Small UAVs 3234
Stephen Thomas Nuske, Michael Dille, Ben Grocholsky, Sanjiv Singh
Convex Optimization Formulation of Robust Nonlinear Model-Predictive-Controller Design 3247
S. Sai Vaddi
B-Splines Based Optimal Control Solution 3262
Ran Dai

Data-Based Model Refinement Using Retrospective Cost Optimization 3276
Anthony D'Amato, Sunil Kukreja, Dennis Bernstein
Gauss Pseudospectral Method for Solving Infinite-Horizon Optimal Control Problems 3291
Divya Garg, William Hager, Anil Rao
Real-Time Optimal Coherent Phantom Track Generation via the Virtual Motion Camouflage Approach 3300
Yunjun Xu, Gareth Basset
Control of Stochastic Time-Variant Uncertain System 3316
Ilan Rusnak
Spacecraft Control with Uncertain Control Gain 3341
Manu Sharma
Analytical Control Law for Spacecraft Reorientation via Lyapunov Theory 3350
Thomas Schlapkohl, Ja-Young Kang, Victoria L. Coverstone
Higher Order Methods for Determining Optimal Controls and Their Sensitivities 3362
Chris McCrate, Srinivas Vadali, Raktim Bhattacharya
Analytical Solutions to Approximations of the Hamilton-Jacobi Equation Applied to Satellite Attitude Control 3376
Stefan Lebel, Christopher Damaren
Agile and Precise Attitude Maneuver of Flexible Spacecraft Based on Nonstationary Frequency-Shaped Robust Control 3387
Ryota Ikeda, Masaki Takahashi
Spacecraft Attitude Tracking and Maneuver Using Combined Magnetic Actuators 3403
Zhiqiang Zhou
Linear Time-Varying Passivity-Based Attitude Control Employing Magnetic and Mechanical Actuation 3420
James Forbes, Christopher Damaren
Reaction-Wheel Momentum Dumping by Hybrid Control of Magnetorquers and Thrusters 3432
Xiaojiang Chen, Hongwei Sun, Jiyang Zhang
Spacecraft Nonlinear Estimation and Control Using Magnetic Measurements and Actuation: A Modified State-Dependent Riccati Equation Approach 3450
Mohammad Abdelrahman, Sang-Young Park
LPV Analysis of Switched Controllers in Satellite Attitude Control Systems 3468
Jean-Marc Biannic, Christelle Pittet, L. Lafourcade, C. Roos
VVAF – Worst Case and Safety Analysis Tools for Autonomous Rendezvous System 3481
Nuno Paulino, Emanuele Di Sotto, Sohrab Salehi, Aymeric Kron, Jean-François Hamel, Wenfei Wang, Prathyush P. Menon, Declan G. Bates, Antonis Papachristodoulou, Christoph Maier
Application of a Two-Step Calculation of the Real Structured Singular Value to the Science Mode of the LISA Mission 3501
André Brito, Jongrae Kim
Robust H_∞/ H_- Thruster Failure Detection and Isolation with Application to the LISA Pathfinder Spacecraft 3514
Alexandre Falcoz, Fabrice Boquet, Grégory Flandin, Pierre Blanc-Paques
H_∞ Controller Design and μ-Analysis: Powerful Tools for Flexible Satellite Attitude Control 3530
Catherine Charbonnel, Thales Alenia
Method for LFT Calculation with High Order Parametric Systems 3544
C. Charbonnel
Loss of Control – Avoidance, Recognition and Recovery: Reducing the Leading Cause of Accidents 3568
John Cox
Accident Lessons for Stall Upset Recovery Training 3622
Dennis Crider

VOLUME 5

Aircraft Loss-of-Control Accident Analysis 3637
Christine Belcastro, John V. Foster
Loss-of-Control: Perspectives on Flight Dynamics and Control of Impaired Aircraft 3676
Harry Kwatny, Jean-Etienne Dongmo, Robert Allen, Bor-Chin Chang, Gaurav Bajpai, T. Dongmo
Aircraft Loss of Control Causal Factors and Mitigation Challenges 3687
Steven Jacobson
Comprehensive In-Flight Simulation Based Advanced Maneuver & Upset Recovery Training Study 3705
Jim Priest, Brian Ernisse, Ryan P. McMahon
Flight Test Results of Adaptive Controllers in Presence of Severe Structural Damage 3722
Girish Chowdhary, Eric Johnson, Rajeev Chandramohan, M. Scott Kimbrell, Anthony Calise
A Computational Study of the Performance and Robustness Properties of Retrospective Cost Adaptive Control 3733
Alexey Morozov, Jesse Hoagg, Dennis Bernstein
Robust Adaptive Control of a Structurally Damaged Aircraft 3747
Karthikeyan Rajagopal, S. N. Balakrishnan, Nhan Nguyen, Kalmanje Krishnakumar
An Adaptive Control Simulation Study Using Pilot Handling Qualities Evaluations 3758
Stefan Campbell, John Kaneshige, Nhan T. Nguyen, Kalmanje S. Krishnakumar
A Multivariable MRAC Scheme Applied to the NASA GTM with Damage 3779
Jiaxing Guo, Gang Tao
Flight Test of an L_1 Adaptive Controller on the NASA AirSTAR Flight Test Vehicle 3793
Irene Gregory, Enric Xargay, Chengyu Cao, Naira Hovakimyan

An Initial Study of Pilot-Adaptive Controller Interactions in Flight Control 3824
Jovan Boskovic, Nathan Knoebel, Joseph A. Jackson
H_∞ Norm Minimization Approach for Slow Adaptive Systems 3836
Jonathan Muse, Anthony Calise
On Calculus of Variations in Aircraft and Spacecraft Formation Flying Path Planning 3868
Andrea L'Afflitto, Cornel Sultan
Yaw Guidance for Airships Under Low Airspeed Conditions 3888
Alexander Joos, Walter Fichter
Improving Tree-Based Trajectories Through Order Reduction/Expansion and Surrogate Models 3897
Baron Johnson, Rick Lind
A Reconfigurable Robot with Telescopic Links for In-Space Servicing 3920
Farhad Aghili
Terrain Features Estimation for the Lunar/Planetary Rover Control 3931
Yuya Kakehashi, Masaki Takahashi
A Generic Framework for Spacecraft GN&C Emulation: Performing a Lunar-like Hop on the Earth 3944
Brett Streetman, Michael C. Johnson, Jules F. Kroehl
Design and Analysis of a Attitude Command Velocity Hold / Hover Hold plus Incremental Position Command Blended Control Mode for Piloted Lunar Landing 3952
Kevin Duda, Michael Johnson, Thomas Fill, Laura Major, Douglas Zimpfer
Improved Lunar Lander Handling Qualities Through Control Response Type and Display Enhancements 3964
Eric Mueller, Karl Bilimoria, Chad Frost
Analytical Dimensional Reduction of a Fuel Optimal Powered Descent Subproblem 3983
Jeremy Rea, Robert Bishop
APLNav Terrain Relative Navigation Airplane Field Test 4015
Melvin White II, Thomas Criss, Dewey Adams
Guidance and Propulsion System Design for Lunar Descent and Landing 4029
Jeff Delaune, Diego De Rosa, Stephen Hobbs
Beyond Monte Carlo: A Computational Framework for Uncertainty Propagation in Planetary Entry, Descent and Landing 4039
Abhishek Halder, Raktim Bhattacharya
Dynamic Environment Mapping for Autonomous Thermal Soaring 4051
Geoffrey Bower, Tristan Flanzer, Alexander Naiman, Suman Saripalli
Simultaneous Exploration and Exploitation of a Wind Field for a Small Gliding UAV 4070
Nicholas Lawrance, Salah Sukkarieh
Flight Path Planning for UAV Atmospheric Energy Harvesting Using Heuristic Search 4092
Anjan Chakrabarty, Jack Langelaan
Autonomous Soaring; Flight Test Results of a Thermal Centering Controller 4110
Klas Andersson
In-Flight Measurement of Dynamic Soaring in Albatrosses 4123
Gottfried Sachs, Johannes Traugott, Florian Holzapfel
Optimal Energy Extraction During Dynamic Jet Stream Soaring 4133
Joachim Grenestedt, John Spletzer
Energy Harvesting and Mission Effectiveness for Small Unmanned Aircraft 4145
Tim McLain, Mark Cutler, Brian Capozzi, Randal W. Beard
Artificial Immune System – Based Aircraft Failure Evaluation over Extended Flight Envelope 4158
Hever Moncayo, Mario Perhinschi, Jennifer Davis
Intelligent Path Planning With Evolutionary Computation 4178
Adam Parry, Raúl Ordóñez
Collision Avoidance for Unmanned Aircraft Using Markov Decision Processes 4203
Selim Temizer, Mykel Kochenderfer, Leslie Kaelbling, Tomas Lozano-Perez, James K. Kuchar
Run-Time Assurance for Advanced Flight-Critical Control Systems 4224
Anthony M. Aiello, John F. Berryman, Jonathan R. Grohs, John D. Schierman
Verification of Multi-Agent Systems Using Formal Approach 4246
Jiyoung Choi, Antonios Tsourdos, Brian White
Nonlinear Analysis of Adaptive Flight Control Laws 4261
Peter Seiler, Gary Balas, Andrei Dorobantu
An LMI-Based Analysis for Adaptive Flight Control with Unmodeled Input Dynamics 4273
Bongjun Yang, Tansel Yucelen, Jong-Yeob Shin, Anthony J. Calise
Comparison of Several Adaptive Controllers According to Their Robustness Metrics 4290
Evgeny Kharisov, Naira Hovakimyan, Karl Åström
Design of a Model Reference Adaptive Controller for an Unmanned Air Vehicle 4317
Luis Crespo, Megumi Matsutani, Anuradha Annaswamy
Dynamic Modeling and Control of A Flexible Four-Rotor UAV 4329
Manohar Srikanth, Anuradha Annaswamy, Eugene Lavretsky
Closed-Loop Optimal Guidance and Control of Quadrotor Unmanned Aerial Vehicle 4341
Jiho Park, Pooya Sekhavat, Mark Karpenko, Isaac Ross
Fault Tolerant Control for Quad-rotor UAV by Employing Lyapunov-based Adaptive Control Approach 4352
Xiaobing Zhang, Youmin Zhang
Design, Development, and Testing of a Low Cost, Fully Autonomous, Indoor Unmanned Aerial System 4366
Girish Chowdhary, Erwan Salaun, Mike Sobers Jr., John Ottander, Eric Johnson

A Practical Stochastic Optimal Guidance Law for a Bounded Acceleration Missile 4387
Gyorgy Hexner, Aaron Pila
Near-Optimal Missile Guidance with Pulse-Motor Control Logic 4410
Erez Sigal, Joseph Ben-Asher
Cooperative Mid Course Guidance for Area Air Defence 4436
Hyo Sang Shin, Antonios Tsourdos, Stéphane Ménec, Keith Markham, Brian A. White
Guidance Laws in Defense Against Missile Attack with Acceleration Constrained Players 4451
Ilan Rusnak
Kinematic Constraint and Bang-Bang Guidance Based Performance Enhancement 4470
T. Srinivasan, P. K. Kar, A. K. Sarkar, Radhakant Padhi
Effect of Reaction-Jet Thrust on Homing Performance of Endoatmospheric Interceptors 4482
Yunqian Li, Xing Cheng, Yanfang Liu, Naiming Qi
Orion Entry Performance-Based Center-of-Gravity Box 4492
Jeremy Rea
Orion Entry Display Feeder and Interactions with the Entry Monitor System 4503
Darren Baird, Mike Grant, Bini Kadwa, Ellen Gillespie, Dave Mathews, Wes Penny, Tim Zak, Brian Bihari
A Comparison between Orion Automated and Space Shuttle Rendezvous Techniques 4516
Jose Ruiz, Jeremy Hart
On-Board Rendezvous Targeting for Orion 4526
Christopher D'Souza, Michael Weeks
Implementation of an Autonomous Multi-Maneuver Targeting Sequence for Lunar Trans-Earth Injection 4537
Ryan Whitley, Cesar Ocampo, Jacob Williams

VOLUME 6

A Modified Lunar Reconnaissance Orbiter (LRO) High Gain Antenna (HGA) Controller Based on Flight Performance 4550
Neerav Shah
Simulation of Multibody Spacecraft Reconfiguration through Sequential Dynamic Equilibria 4566
Joseph Shoer, Mason Peck
Gimbal-Lock Escape via Nonlinear-Orthogonal Torque Compensation 4580
Frederick Leve, Josue Munoz, Norman Fitz-Coy
Minimum Resolvable Torque Mitigation Using Variable Speed Control Moment Gyros 4596
Jerry Fausz, Brandon Dekock
Ground Demonstration of a Solar Sail Attitude Control Actuator 4604
S. Nasir Adeli, Vaios Lappas, Theodorous Theodorou
Design Criteria for Spin Deployment of Gossamer Structures Considering Nutation Dynamics 4618
Daisuke Haraguchi, Hiraku Sakamoto, Yoji Shirasawa, Osamu Mori
Interaction Between Strategic and Local Traffic Flow Controls 4640
Shon Grabbe, Banavar Sridhar, Avijit Mukherjee, Alexander Morando
Airspace Complexity Estimations Based on Data-Driven Flow Modeling 4654
Erewan Salaun, Maxime Gariel, Adan E. Vela, Eric Feron, John-Paul B. Clarke
Optimizing Flight Departure Delay and Route Selection Under En Route Convective Weather 4670
Avijit Mukherjee, Banavar Sridhar, Shon Grabbe
Improved Dynamic Generation of Operationally-Acceptable Reroutes Using Network Optimization 4681
Christine Taylor, Craig Wanke
Incorporating User Preferences within an Optimal Traffic Flow Management Framework 4701
Joseph Rios, Kapil Sheth, Sebastian Guitierrez-Nolasco
Simulations of Credits Concept with User Input for Collaborative Air Traffic Management 4710
Kapil Sheth, Sebastian Gutierrez-Nolasco, James Courtney, Patrick Smith
User and Service Provider Collaboration on Flight Route and Delay under Uncertainty 4724
Jeffrey Henderson, Husni Idris, Jimmy Krozel, Rafal Kicinger, Sarah Ferguson
Guidance Law Based on Bifurcating Velocity Field for Formation Flight 4743
Masahiro Kokume, Kenji Uchiyama
Ground Target Tracking for Unmanned Aerial Vehicles 4754
Tiago Oliveira, Pedro Encarnação
Flight Control of VTOL Quadrotor Aircraft via Output Feedback 4767
Fang Liao, Kai-Yew Lum, Jianliang Wang
Receding Horizon Control of UAVs Using Gradual Dense-Sparse Discretizations 4779
Petter Ogren, John Robinson
Application of Collision Avoidance on Flying Vehicles 4790
Tim Brdar, Stefan Bieniawski, Dusan Stipanovic, John Vian
Some Thoughts on Reducing the Risk of Aircraft Loss of Control 4800
Don Bateman
Examination of Icing Induced Loss of Control and its Mitigations 4819
Andrew Reehorst, Harold Addy Jr., Renato Colantonio
Development and Implementation of a Model-Driven Envelope Protection System for In-Flight Ice Contamination 4833
David Gingras, Billy Barnhart, Richard Ranaudo, Borja Martos, Thomas P. Ratvasky

Future Integrated Systems Concept for Preventing Aircraft Loss-of-Control Accidents 4849
Christine Belcastro, Steven Jacobson
Validation and Verification of Future Integrated Safety-Critical Systems Operating under Off-Nominal Conditions 4865
Christine Belcastro
Adaptive Detection of Aircraft Actuator Failures and Aerodynamic Damage 4893
Stephen Mack, Gang Tao, Jason Burkholder
Controlling Chaotic Motions of a Nonlinear Aeroelastic System Using Adaptive Control Augmented with Time Delay 4910
Robert Bruce Alstrom, Pier Marzocca, Erik Bollt, Goodarz Ahmadi
Vibration Suppression of Flexible Manipulator by Combining Modified Input Shaping and Adaptive Positive Position Feedback Control 4924
Ryan Orszulik, Jinjun Shan
Model Reference Adaptive Control of a Quadrotor UAV 4944
Brian Whitehead, Stefan Bieniawski
Adaptive Actuator Nonlinearity Compensation and Disturbance Rejection Applied to Aircraft Models with Synthetic Jet Actuators 4957
Stephen Mondschein, Gang Tao, Jason Burkholder
Designing Asymptotics and Transients of Linear Stochastic Automaton Networks 4981
Mengran Xue, Sandip Roy, Yan Wan, Ali Saberi
Towards a Location-Scheduled Controller for Nanosatellites 4996
Matt Sorgenfrei, Sanjay Joshi, Elwood Agasid, John Hines
A Focusing Procedure for Nanosatellite Star Trackers 5008
Thomas Dzamba, John Enright
A Dynamic Model of a Passive Magnetic Attitude Control System for the RAX Nanosatellite 5025
Geeyong Park, Sheryl Seagraves, N. H. McClamroch
Hammerstein Model-Based Correlation UIO Method for Fault Detection of Nonlinear Flight Control Systems 5043
Kai-Yew Lum, Jun Xu, Ai-Poh Loh
A Multi-Resolution Approach with Sparseness Property for Input-Output Approximation 5066
Cheng Jin, Puneet Singla, Tarunraj Singh
Actuator and Sensor Fault Reconstruction Using an LPV Sliding Mode Observer 5081
Halim Alwi, Christopher Edwards, Andres Marcos
Application of a Decentralized Observer with a Consensus Filter to Distributed Spacecraft Systems 5105
Milan Mandic, Behcet Acikmese, Jason Speyer
Kinetic State Tracking for a Class of Singularly Perturbed Systems 5119
Anshu Siddarth, John Valasek
Chance Constrained RRT for Probabilistic Robustness to Environmental Uncertainty 5144
Brandon Luders, Mangal Kothari, Jonathan How
Definition and Demonstration of a Methodology for Validating Aircraft Trajectory Predictors 5165
Robert Vivona, Mike Paglione, Karen Cate, Gabriele Enea
Accuracy Comparison of an Operational and Experimental Strategic Conflict Probe 5187
Confesor Santiago, Andrew Crowell, Jeffrey Lehman
A Computer Simulation of the System-Wide Effects of Parallel-Offset Route Maneuvers 5201
Todd Lauderdale, Confesor Santiago, Carl Pankok
Implementation and Validation of a 4-D Trajectory Fuel Burn Model Application 5210
Robert Oaks, Hollis Ryan, Mike Paglione
Using Automatic Dependent Surveillance-Broadcast Data for Monitoring Aircraft Altimetry System Error 5227
Christine Falk, Juan Gonzalez, Jose Perez
A Simulation Study on Identifying Aircraft Touchdown Point by Using In-Flight Recorded Data 5239
Andrew Cheng, Ming Ouyang
The Design of Trigger Mechanisms for Aircraft Collision Avoidance Maneuvers 5244
Rushen Patel, Paul Goulart
Information-Based Framework for Aircraft Integrated Mission Planning 5256
Nan Wang, Tianjiang Hu, Lincheng Shen, Jing Chen
Combining Traffic and Terrain Constraints into the Ecological Vertical Situation Display 5267
Clark Borst, Patrick Rijneveld, Max Mulder, M. M. Van Paassen
The Effect of Synthetic Vision Enhancements on Landing Flare Performance 5287
Clark Borst, Luan Le Ngoc, Max Mulder, M. M. Van Paassen
Non-Intrusive Uncertainty Quantification for Hypersonic Flight Using Direct Quadrature 5313
Jangho Yoon, Peter Attar, Prakash Vedula
Improved Delay-Tolerant Communication by Considering Radio Propagation in Planning Data Ferry Navigation 5322
Anthony Carfang, Eric Frew, Timothy X. Brown
Fast Ascent Trajectory Optimization for Hypersonic Air-Breathing Vehicles 5336
Oscar Murillo Jr., Ping Lu
Improvements to Optimal Launch Ascent Guidance 5360
Binfeng Pan, Ping Lu
Linear Covariance Techniques for Powered Ascent 5377
M. Benjamin Rose, David Geller
Day of Launch Profile Selection for Pad Abort Guidance 5398
Ryan Whitley, Ryan W. Proud

Wind Field Estimation for Small Unmanned Aerial Vehicles 5411
Jack Langelaan, Nicholas Alley, James Neidhoefer
Evaluation of UAS Concepts of Operation for Severe Storm Penetration Using Hardware-in-the-Loop Simulations 5432
Jack Elston, Brian Argrow, Eric Frew, Adam Houston

VOLUME 7

Receding Horizon Control for Atmospheric Energy Harvesting by Small UAVs 5447
Nathan Depenbusch, Jack Langelaan
A Geometric Treatment of Directed Guidance Regulation 5468
Gregory Hicks, Robert Fuentes
Proportional Navigation Against Multiple Targets 5483
Oren Gutman, Zalman Palmor
Indirect Control of Impact Angle Against Stationary Targets Using Biased PPN 5505
Koray Erer, Osman Merttopcuoglu
A Nonlinear Suboptimal Guidance Law with 3-D Impact Angle Constraints for Ground Targets 5512
Radhakant Padhi, Harshal Oza
Anti-Ship Missile's Guidance Law Estimation Filter Using IMM Estimator 5537
Joongsup Yun, Chang-Kyung Ryoo, Keeyoung Choi
Cooperative Localization of Low-Cost UAV Using Relative Range Measurements in Multi-UAV Flight 5545
Yaohong Qu, Youmin Zhang
Observability of a Stationary GPS-Aided INS 5558
John Ryley, Peter Silson, Antonios Tsourdos, Simon Jordan
GPS-Based Relative Navigation of LEO Formations with Varying Baselines 5574
Urbano Tancredi, Alfredo Renga, Michele Grassi
Sequential Processing of Integrated Measurements in Tightly-Coupled INS/GPS Integrated Navigation System 5589
Junchuan Zhou, Stefan Knedlik, Otmar Loffeld
Analytic Fault Tolerant Navigation System for High Lift Re-entry Vehicles 5608
Francesco Nebula, Roberto Palumbo, Federico Corraro
Application of LPV Modeling, Design and Analysis Methods to a Re-entry Vehicle 5617
Andres Marcos, Joost Veenman, Carsten Scherer, Gabriele De Zaiacomo, David Mostaza, Murray Kerr, Hakan Koroglu, Samir Bannani
LPV Control for Flexible Launcher 5635
Martine Ganet-Schoeller, M. Ducamp
Robust LPV Control Design for a RLV During Reentry 5654
Nicolas Fezans, Daniel Alazard, Nicole Imbert, Benjamin Carpentier
Development and testing of an FDI Filter for a Reusable Launch Vehicle During Ascent 5676
Murray Kerr, Andres Marcos, Luis Penin
An Enhanced Information Structure for Linear Parameter-Varying Design: Application to Reichert's Missile Benchmark 5693
Safta De Hillerin, Vincent Fromion, Gerard Scorletti, Gilles Duc, Emmanuel Guduy
A Novel Single Thruster Control Strategy for Spacecraft Attitude Stabilization 5711
Godard Kumar, Krishna Kumar,
Attitude Stabilization of LISA Pathfinder Spacecraft Using Colloidal Micro-Newton Thrusters 5730
Shufan Wu, Luisella Giulicchi, Thomas Fenal , Mark Watt
Attitude Control of LISA Pathfinder Spacecraft with Micro-Newton FEEP Thrusters Under Multiple Failures 5743
Shufan Wu, Luisella Giulicchi, Thomas Fenal , Mark Watt
Controller Design Method for Drag-Free Systems with Micro-Propulsion Constraints 5759
Rainer Saage, Ralph Ross, Alexander Schleicher, Walter Fichter
Optimal Attitude Control of Flexible Spacecraft with Minimum Vibration 5774
Meiyu Cui, Shijie Xu
Motion Planning in Constrained Airspace using Circular and Oval Helices as Trajectory Primitives 5790
Abraham Pachikara, Rick Lind
Optimal Tracking of Time-Varying Modes for Control of Morphing Aircraft 5809
Daniel Grant, Rick Lind
A Study on a Velocity Control System Design Using the Dynamic Inversion Method 5826
Keisuke Enomoto, Takeshi Yamasaki, Hiroyuki Takano, Yoriaki Baba
A Study on the Dynamic Inversion Method with Nonlinear Function Considering Saturation 5841
Keisuke Enomoto
Minimum-Cost Trajectories for Longitudinal Flight of UAVs 5856
Masanori Harada, Kevin Bollino
Vision-Based Recovery and Guidance for Small Unmanned Air Vehicles 5868
Aaron Kahn
Vision-Based Three Dimensional Navigation Frame Mapping and Planning for Collision Avoidance for Micro Air Vehicles 5886
Huili Yu, Randal Beard
Optic Flow-Based State Estimation for an Indoor Micro Air Vehicle 5898
Mark Verveld, Qi-Ping Chu, Christophe De Wagter, J. A. Mulder

UAV Motion Estimation Using Low Quality Image Features 5919
Ryan Gariepy, Steven Waslander
LASER-Aided Inertial Navigation for Autonomous Indoor Flight 5933
D. Michael Sobers Jr., Shusaku Yamaura, Eric N. Johnson
Indirect Adaptive Control for Systems with Unknown or Varying Dynamics 5989
Solmaz Sajjadi-Kia, Sung Kang, Jason Speyer
Nonparametric Adaptive Attitude Control System Accommodating Nonlinearity and Uncertainty 6000
Yuzo Shimada, Akio Abe, Yasushi Ohtsuka
Model Reference Adaptive Fight Control Adapted for General Aviation: Controller Gain Simulation and Preliminary Flight Testing On a Bonanza Fly-by-Wir Testbed 6017
James Steck, Kimberly Lemon, Brian Hinson, Dwayne Kimball, Nhan Nguyen
Adaptive Trajectory Planning for a Quad-rotor Unmanned Aerial Vehicle 6035
Abbas Chamseddine, Camille-Alain Rabbath, Youmin Zhang
Pseudo Control Hedging and its Application for Safe Flight Envelope Protection 6050
Thomas Lombaerts, Gertjan Looye, Q. P. Chu, J. A. Mulder
H_∞ LPV State Feedback Control for Flexible Hypersonic Vehicle Longitudinal Dynamics 6067
Hunter Hughes, Fen Wu
Fault Recoverability of Switched Systems with Application to Longitudinal Flight Process 6080
Hao Yang, Bin Jiang, Huajun Gong
Control Centric Parametric Trade Studies for Scramjet-Powered Hypersonic Vehicles 6089
Christopher Whitmer, Atul Kelkar, Jerald Vogel, Christopher Ford, D. S. Chaussee
Stabilization of a Nonlinear Aeroelastic Wing Section Using Modified Model-Free Control with Self-Improvement of Control Performance 6118
Fan Zhang, Dirk Söffker
Control-Oriented Uncertainty Modeling and Robust Nonlinear Control Design for Hypersonic Flight Vehicles 6127
Obaid Ur Rehman, Baris Fidan, Ian Petersen
Aircraft Noise Exposure Around Airports - A Differential Flat Approach for Trajectory Assessment 6142
Teo Revoredo, Jules Slamma, Karim Achaibou, Felix Mora-Camino
Guidance and Control Algorithm Robustness Baseline Indexing 6154
Bradley Steinfeldt, Robert Braun, Stephen C. Paschall II
Design and Simulation Methodology to Improve the Performance of Airspace Tube Networks 6172
Banavar Sridhar, Tanim Islam, Gautam Gupta
Effect of Dynamic Sector Boundary Changes on Air Traffic Controllers 6188
Jaewoo Jung, Paul Lee, Angela Kessell, Jeffrey Homola, Shannon Zelinski
Three Dimensional Sector Design with Optimal Number of Sectors 6194
Min Xue
Air Traffic Sector Configuration Change Frequency 6210
Gano Broto Chatterji, Michael Drew
A Sectorization Method for Dynamic Airspace Configuration 6220
Tong Wang, Jinhua Li, Inseok Hwang
A Human-in-the-Loop Exploration of the Dynamic Airspace Configuration Concept 6233
Jeffrey Homola, Paul Lee, Thomas Prevot, Hwasoo Lee, Angela Kessell, Connie Brasil, Nancy Smith
A Game-Based Realization and RISE Treatment of Disturbances in Satellite Post-Docking 6256
Takashi Hiramatsu
Flexible Spacecraft Control Using Robust Feedback Linearization 6267
Maryam Malekzadeh, Abolghasem Naghash, Ali Talebi
Formation Flying Control of Small Satellites 6289
Junquan Li, Yaodong Pan, Krishna Dev Kumar
Inertia-free Spacecraft Attitude Tracking with Reaction-Wheel Actuation 6314
Avishai Weiss, Xuebo Yang, Ilya Kolmanovsky, Dennis S. Bernstein
Stability and Control of a Flux-Pinned Docking Interface for Spacecraft 6343
Laura Jones, Mason Peck

VOLUME 8

Observer-Based Robust H_1 Reliable Control Design for a Class of Spacecraft Rendezvous Systems 6355
Zhifeng Gao, Bin Jiang, Huajun Gong, Yufei Xu
Generalized Multiplicative Extended Kalman Filter for Aided Attitude and Heading Reference System 6369
Philippe Martin, Erwan Salaun
Fault Tolerance for Spacecraft Attitude Management 6382
Ali Nasir, Ella Atkins
Robustness Evaluation of Theta-D Technique for Spacecraft Attitude Control Subject to Reaction Wheel Failures 6405
Quang Lam, Ming Xin
Spacecraft Maneuver Control with Power Limited Reaction Wheels 6422
Dov Verbin, Vaios Lappas
Adaptive Backstepping Based Fault Tolerant Spacecraft Attitude Control Under Loss of Actuator Effectiveness 6447
Qinglei Hu, Bing Xiao, Youmin Zhang
Comparison of Numerical Predictor-Corrector and Apollo Skip Entry Guidance Algorithms 6468
Christopher Brunner, Ping Lu

Handling Qualities of a Capsule Spacecraft During Atmospheric Entry 6488
Karl Bilimoria, Eric Mueller
Launch Vehicle Guidance for Low Energy Re-entry 6502
John Schierman, Kenneth Horneman, David Neal, Shelly Su, Craig Kluever
A State-Dependent Riccati Equation Approach to Atmospheric Entry Guidance 6520
Bradley Steinfeldt, Panagiotis Tsiotras
Energy-Based Suboptimal Reentry Guidance of a Reusable Launch Vehicle Using Model Predictive Static Programming 6540
Radhakant Padhi, Omkar Halbe, S. Mathavaraj
Robust Control of a Reusable Launch Vehicle in Reentry Phase Using Model Following Neuro-Adaptive Design 6563
Radhakant Padhi, S. Mathavaraj, Omkar Halbe
Motion Planning in Urban Environments to Achieve Sensor Quality Metrics 6588
Ryan Hurley, Rick Lind, Joseph Kehoe
Multiple-Vehicle Circular Search, Surveillance, and Attack 6607
James Cloutier
Nonlinear Geometric and Differential Geometric Guidance of UAVs for Reactive Collision Avoidance 6618
Radhakant Padhi, Anusha Mujumdar
Cooperative Control of a Team of Unmanned Vehicles Using Smoothed Particle Hydrodynamics 6643
Doug Lipinski, Kamran Mohseni
Dynamic Mapping of Forest Fire Fronts Using Multiple Unmanned Aerial Vehicles 6650
Connie Phan, Hugh Liu
A ZEM-Based Effective Integrated Estimation and Guidance of Interceptors in Terminal Phase 6669
Radhakant Padhi, Prasiddha Dwidevi, S. Tiwari, Abhijit Bhattacharyya
Tracking of Spiraling Reentry Vehicles with Varying Frequency Using the Unscented Kalman Filter 6694
Ernest Ohlmeyer, P. Menon, Jinwhan Kim
Cooperative Multiple Model Adaptive Guidance for an Aircraft Defending Missile 6715
Vitaly Shaferman, Tal Shima
Investigation of Derivative Free Estimator by Mixing State Dependent Factorization Model with EKF Solver 6740
Quang Lam, Ming Xin
Laser-Guided Rocket Inertial Measurement Unit Performance Determination Using Trajectory Reconstruction 6751
Jacob Niehus, Curtis Mracek
Consensus Filter on Networked Double-Integrator Systems 6760
Ming Xin, Jianan Wang
Distributed Event-Triggered Consensus Algorithm for Uncertain Multi-Agent Systems 6774
Evgeny Kharisov, Xiaofeng Wang, Naira Hovakimyan
Guidance of Receiver Aircraft to Rendezvous with Tanker in the Presence of Wind 6789
Jane-Wit Kampoon, Atilla Dogan
Predicting the Performance of Uncertain Multi-Agent Systems Using Event-Triggering and L_1 Adaptation 6816
Xiaofeng Wang, Naira Hovakimyan
Constructing Consensus Controllers for Networks with Identical General Linear Agents 6831
Tao Yang, Sandip Roy, Yan Wan, Ali Saberi
Cooperative Communication Failure Detection for Multiple Vehicle Systems 6853
Hojjat Izadi, Brandon Gordon, Youmin Zhang
A Novel Inertial Coarse Alignment Method 6862
Peter Silson, Simon Jordan
Waypoint Navigation Heuristic for a Small UAV with Non-Uniform Settling Lengths 6876
Alan Jennings, Raúl Ordóñez, Nicola Ceccarelli
A Comparison of Extended Kalman Filter, Sigma-Point Kalman Filter, and Particle Filter in GPS/INS Sensor Fusion 6891
Jason Gross, Yu Gu, Srikanth Gururajan, Brad Seanor, Marcello Napolitano
Sensitivity Analysis for Constrained Relative Attitude Determination Involving Two Vehicle Formations 6911
Richard Linares, John Crassidis, Yang Cheng
Distributed Cooperative SLAM Using Information Consensus Filter 6923
Rajnikant Sharma, Clark Taylor, David W. Casbeer, Randal W. Beard
Robustness Analysis of a Simultaneously Stabilizing Controller: A Flight Control Case Study 6931
Yasaman Saeedi, Hugh Liu, Ruben Perez
Robustness Analysis on Pitch Control Law for an Executive Transport Aircraft 6947
Jong-Yeob Shin, Clay Harden
Elevator Sizing, Placement, and Control-Relevant Tradeoffs for Hypersonic Vehicles 6962
Jeffrey Dickeson, Armando Rodriguez, Srikanth Sridharan, Akshay Korad
Spacecraft Attitude Estimation via Stochastic H_∞ Filtering 6984
Daniel Choukroun, Nadav Berman, Lotan Cooper
Astrometric and Photometric Data Fusion for Resident Space Object Orbit, Attitude, and Shape Determination Via Multiple-Model Adaptive Estimation 7010
Hakjae Kim, John Crassidis, Richard Linares, Moriba K. Jah
Surveying and Pose Estimation of a Lander Using Approximative Crater Modelling 7028
David Wokes, Stephen Wokes
Attitude Data Fusion Using a Modified Rodrigues Parametrization 7046
Christopher Nebelecky

A Robust Estimator for Almost Global Attitude Feedback Tracking 7062
Amit Sanyal, Nikolaj Nordkvist
Autonomous Attitude Determination and Control for Planetary Penetrator Missions 7079
Aarthy Badrakalimuthu, Vaios Lappas, Jozef Van Der Ha
Fuel Optimal, Low-Thrust Earth-to-Moon Trajectories Design Using the Initial Guess Structure 7095
Donghun Lee, Hyochoong Bang, Wonseok Lee
Object Correlation, Maneuver Detection, and Maneuver Characterization Using Control Effort Metrics with Uncertain Boundary Conditions and Measurements 7117
Marcus Holzinger, Daniel Scheeres
Terminal-Phase Guidance and Control Analysis of Asteroid Interceptors 7138
Matt Hawkins, Bong Wie, Jesus Gil-Fernandez
Electrodynamic Tether Trajectory Optimization Using Multiple Time Scales 7162
Robert Stevens
Libration Synchronization Control of Clustered Electrodynamic Tether System Using Kuramoto Model 7174
Hirohisa Kojima, Hiroki Iwashima
Statistical Orbit Determination by Global Evolutionary Optimization and Batch Filter 7200
Ran Dai, Heping Liu
Dynamic Properties of Visual Cueing Systems in Flight Simulators 7209
Sunjoo Advani
Preliminary Design of a Crewed Mission to Asteroid Apophis in 2029-2036 7219
Daniel Zimmerman, Sam Wagner, Bong Wie
Active Aeroelastic Control of the Supersonic Semispan Transport (S4T) Model 7239
Kevin Roughen, Oddvar Bendiksen, Ross Gadient
Methods for Computing Minimum-Time Paths in Strong Winds 7251
Matthew Jardin, Arthur Bryson Jr.
Wind Effects on the Maximum Range Performance of Motor Gliders with Retractable Engine 7260
Gottfried Sachs, Jalkob Lenz, Florian Holzapfel

VOLUME 9

Active Control of Aerial Refueling Hose-Drogue Systems 7271
Kapseong Ro, Taeseung Kuk, James Kamman
Investigation of Energy Management during Approach - Evaluating the Total Energy-Based Perspective Flight-Path Display 7283
Mark Van Den Hoven, Paul De Jong, Clark Borst, Max Mulder, M. M. Van Paassen
Derivative-Free Model Reference Adaptive Control of a Generic Transport Model 7304
Tansel Yucelen, Anthony Calise
Verification and Tuning of an Adaptive Controller for an Unmanned Air Vehicle 7321
Luis Crespo, Megumi Matsutani, Anuradha Annaswamy
Retrospective Cost Adaptive Control of the NASA GTM Model 7336
Benjamin Coffer, Jesse Hoagg, Dennis Bernstein
Application of a Novel Adaptive Reset Controller to the GTM 7357
Megumi Matsutani, Anuradha Annaswamy, Luis Crespo
Comparison of Model Reference Adaptive Controller Designs Applied to the NASA Generic Transport Model 7374
Eugene Lavretsky, Jason Levin, Ross Gadient
Robustness Analysis of an L_1 Adaptive Controller 7390
Peter Seiler, Gary Balas, Andrei Dorobantu
State-Space Approximations of the Orr-Sommerfeld System with Boundary Inputs and Outputs 7401
Arthur Or, Jason Speyer, John Kim
Minimum Base Reaction Control for Multi-Link Systems in a Field with Obstacles 7421
Brandon Brown, Tarunraj Singh
H_∞ Tracking with Commands Generated by Unstable Autonomous Systems Having Initial Conditions in Finite Hyper-Rectangles 7432
Shmuel Boyarski, Isaac Yaesh, Uri Shaked
Real-Time Obstacle Avoiding Path Planning for Mobile Robots 7442
Ji-Wung Choi, Renwick Curry, Gabriel Elkaim
Control-Oriented Design of Operating Range for Linear Parameter Varying Systems for Closed-Loop Performance 7457
Sanketh Bhat, Rick Lind
Adaptive Control for Small Fixed-Wing Unmanned Air Vehicles 7475
Aaron Kahn
Towed Body Altitude Stabilization and States Estimation in Aerial Recovery of Micro Air Vehicles 7492
Liang Sun, Randal Beard
Guidance & Control of Micro Air Vehicles: Rapid Prototyping & Flight Test 7505
David Halaas, Stefan Bieniawski
Determining Aerodynamic Characteristics of a Micro Air Vehicle Using Motion Tracking. 7523
Daniel V. Uhlig, Agrim Sareen, Pritam Sukumar, Arjun H. Rao, Michael S. Selig
Attitude Estimation and Control of a Hovering Mini Aerial Vehicle 7534
Pierre-Richard Bilodeau, Éric Poulin, Franklin Wong, Eric Gagnon

Control of a Micro Aerial Vehicle: Stability Derivatives and Their Measurements 7542
Matthew Shields, Kamran Mohseni
Two Reconfigurable Control Allocation Schemes for Unmanned Aerial Vehicle Under Stuck Actuator Failures 7550
Qing-Li Zhou, Youmin Zhang, Camille-Alain Rabbath, Jacob Apkarian
Cooperative Multi-UAV Search Problem with Communication Delay 7561
Mostafa Mirzaei, Brandon Gordon, Camille-Allain Rabbath, Farid Sharifi
Improving the Efficiency of a Decentralized Tasking Algorithm for UAV Teams with Asynchronous Communications 7572
Luke Johnson, Sameera Ponda, Han-Lim Choi, Jonathan How
Coalition Formation With Communication Delays and Maneuvering Targets 7594
Joel George, P. Sujit, Joao Sousa
Cooperative Target Localization with a Communication-Aware Unmanned Aircraft System 7609
Maciej Stachura, Eric Frew
Multi-Agent Decentralized Search of a Probability Map with Communication Constraints 7624
Travis Millet, David Casbeer, Travis Mercker, Jacob L. Bishop
Safe Path Planning in the Presence of Large Communication Delays Using Tube Model Predictive Control 7636
Hojjat Izadi, Brandon Gordon, Youmin Zhang
Decentralized Sliding Control of Cooperative Multi-Agent Systems Subject to Communication Delays 7650
Farid Sharifi, Brandon W. Gordon, Youmin Zhang
Recent Experiences of the NASA Engineering & Safety Center (NESC) GN&C Technical Discipline Team (TDT) 7661
Cornelius Dennehy
What's New is What's Old: Use of Bode's Integral Theorem (circa 1945) to Provide Insight for 21st Century Spacecraft Attitude Control System Design Tuning 7688
Mike Ruth, Kenneth Lebsock, Cornelius Dennehy
The Value of Identifying and Recovering Lost GN&C Lessons Learned: Aeronautical, Spacecraft, and Launch Vehicle Examples 7714
Cornelius Dennehy, Steve Labbe, Kenneth L. Lebsock
Observations on the State of NASA's GN&C Engineering Discipline: Results of an Independent Non-Advocate Study 7737
Gerald Pawlikowski, Cornelius Dennehy
Exploiting Expertise and Knowledge Sharing Online for the Benefit of NASA's GN&C Community of Practice 7757
Daria Topousis, Cornelius Dennehy, Kenneth L. Lebsock
GN&C Design Overview and Flight Test Results from NASA's Max Launch Abort System (MLAS) 7771
Cornelius Dennehy, Raymond Lanzi, Philip Ward
Applying Monte Carlo Simulation to Launch Vehicle Design and Requirements Verification 7794
John Hanson, Bernard Beard
Present Challenges, Critical Needs, and Future Technological Directions for NASA's GN&C Engineering Discipline 7811
Cornelius Dennehy
Vehicle Routing Problem Instances: Application to Multi-UAV Mission Planning. 7833
Mariam Adbelhafiz, Ahmed Mostafa, Anouck Girard
Approximate Dynamic Programming with State Aggregation Applied to Perimeter Patrol 7845
Krishnamoorthy Kalyanam, Meir Pachter, Swaroop Darbha, Phil Chandler
Cooperative UAV Trajectory Planning with Multiple Dynamic Targets 7855
Zhenshen Qu, Xiangming Xi, Anound Girard
Info-Gap Approach for Unmanned Aerial Vehicle Tracking of Ground Moving Targets Under Severe Uncertainty 7864
Yehuda Moran, Tal Shima, Yakov Ben-Haim
Application of Proper Orthogonal Decomposition and Artificial Neural Networks to Multiple UAV Task Assignment 7883
Laura Humphrey, Kelly Cohen, Steven Rasmussen
Persistent Patrol in Stochastic Environments with Limited Sensors 7893
Vu Anh Huynh, Emilio Frazzoli, John J. Enright
Ares I Flight Control System Design 7907
Nazerth Bedrossian, Jiann-Woei Jang, Abran Alaniz, Robert Hall, Charles Hall, Stephen Ryan, Mark Jackson
Orion Flight Performance Design Trades 7921
Mark Jackson, Timothy Straube
GN&C Development for Future Lunar Landing Missions 7937
Tye Brady, Stephen Paschall II, Timothy P. Crain II
Flight Dynamics and GN&C for Spacecraft Servicing Missions 7946
Doug Zimpfer, Bo Naasz, Ray Barrington, Tom Mulder
Designing and Validating Proximity Operations Rendezvous and Approach Trajectories for the Cygnus Mission 7962
Piero Miotto, Louis Breger, Ian Mitchell, Brian Keller, Brian Rishikof
Satellite Attitude Determination and Estimation Using Two Star Trackers 7980
Jonghee Bae, Youdan Kim, Hee Seob Kim
Novel Star Identification Method Combining Two Star Trackers with Extended FOVs 8003
Koki Ho, Shinichi Nakasuka
Star Tracking Using Color CMOS Detectors 8018
John Enright, Geoff McVittie
An Autonomous Six Degree-of-Freedom Navigation System for a Maneuverable Pico-Satellite Rendezvous Mission 8039
Cinnamon Wright, E. Glenn Lightsey

Ground-Based Precision Attitude Determination Using Repeated Smoothing with Sequential Rate Bias and Attitude Estimation 8062
Takanori Iwata, Masashi Uo, Tetsuo Kawahara
An Airborne Emergency Conflict Resolution against a Non-Cooperative Aircraft 8079
Vincent Kuo
Hybrid Optimal Control Approach to Commercial Aircrafts 3-D Multiphase Trajectory Optimization 8098
Manuel Soler-Arnedo, Alberto Olivares, Ernesto Staffetti
Control Space Analysis of Three-Degree Decelerating Approaches at Amsterdam Airport Schiphol 8114
Paul De Jong, A. C. In'T Veld, A. M. P. De Leege, M. M. Van Paassen, M. Mulder
Multi-Purpose Cockpit Display of Traffic Information: Overview and Development of Performance Requirements 8134
Hans Stassen, William Penhallegon, Lesley Weitz
4-D Green Approach Trajectory: Illustrative Assessment On Toulouse Approach 8152
Thierry Miquel, Helene Manzoni, Frederic Legrand, Didier Martin, Magali Millischer
Air Traffic Flow Management under NextGen Mixed Equipage Conditions 8167
Arash Yousefi, Ali Tafazzoli, Girishkumar Sabhnani, Babak Khorrami
Author Index