2018 IEEE 5th International Conference on Methods and Systems of Navigation and Motion Control (MSNMC 2018)

Kiev, Ukraine
16-18 October 2018

IEEE Catalog Number: CFP1852Y-POD
ISBN: 978-1-5386-5871-0

Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP1852Y-POD
ISBN (Print-On-Demand): 978-1-5386-5871-0
ISBN (Online): 978-1-5386-5870-3

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
E-mail: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Plenary Session

V. M. Sineglazov, S. O. Dolgorukov
Intelligent Integrated CADs of Navigation Equipment Testing System 7

O. M. Tachinina, O. I. Lysenko, I. V. Alekseeva
Algorithm for Operational Optimization of Two-Stage Hypersonic Unmanned Aerial Vehicle Branching Path 11

Denis Karabetsky, Viktor Sineglazov
Analysis of Solar Rechargeable Airplane 16

Session A. Methods of Navigation and Control of Aircraft Motion

V. V. Avrutov, V. V. Meleshko, S. O. Davydenko
Latitude Determination on the Strapdown Inertial Technology 20

A. G. Holubnychyi, G. F. Konakhovych, A. G. Taranenko, Ye. I. Gabrousenko
Comparison of Additive and Multiplicative Complementary Sequences for Navigation and Flight Control Systems 24

A. G. Taranenko, Ye. I. Gabrousenko, A. G. Holubnychyi, I. A. Slipukhina
Estimation of Redundant Radionavigation System Reliability 28

I. V. Ostroumov, N. S. Kuzmenko, K. Marais
Optimal Pair of Navigational Aids Selection 32

N. S. Kuzmenko, I. V. Ostroumov, K. Marais
An Accuracy and Availability Estimation of Aircraft Positioning by Navigational Aids 36

Oleksandr Solomentsev, Maksym Zaliskyi
Correlated Failures Analysis in Navigation System 41

A. Al-Ammouri, H. A. Al-Ammouri, V. S. Kharuta, A. E. Klochan
Device for Increasing the Data Reliability in Navigation Systems 45

Igor M. Petrov, Nickolay D. Rudnichenko, Natalia O. Shybaieva, Yurii A. Gunchenko
Service Ergatic System of Marine Vehicles Coordination Navigation Information Control Processes 49

Vladimir Sherstjuk, Maryna Zharikova, Olena Liashenko, Dmytro Kyryichuk, Igor Sokol
Motion Coordination in Heterogeneous Ensemble Using Constraint Satisfaction Method 54

Maryna Mukhina, Iryna Barkalova
Algorithm of Ground Object Detection with Modified SURF Method by Using Morphological Features 59

O. O. Chuzha
Model of Analysis LIDAR's 3D Images for Survey-Comparative Navigation Systems 63

Sergey A. Shvorov, Dmytro S. Komarchuk, Natalia A. Pasichnyk, Oleksiy A. Opryshko, Yurii A. Gunchenko, Svitlana D. Kuznichenko
UAV Navigation and Management System Based on the Spectral Portrait of Terrain 68

A. K. Ablesimov, M. A. Pylypenko, K. A. Adamchuk, N. V. Usenko
On the Issue of the Stability of Navigation and Motion Control Systems 72

M. K. Filyashkin
Inertial-Satellite Navigation System for Unmanned Aerial Vehicles with Double-Deck Estimation of Flight-Navigation Parameters 76

978-1-5386-5871-0/18 $31.00 © 2018 IEEE

V. M. Kazak, D. O. Shevchuk, L. V. Panchuk, V. V. Shulevka
Methods and Tools for Evaluating the Accuracy of the Air Navigation Using GNS 79

Session B. Design of Optimal Control Systems and Aviation Instruments

A. A. Tunik
Simplified Path Tracking Control Laws for Quad-rotor Considered as Nonholonomic System . 83

D. Kucherov, A. Kozub, A. Rasstrygin
Setting the PID Controller for Controlling Quadrotor Flight: a Gradient Approach 90

Oleg Barabash, Nataliia Dakhno, Halyna Shevchenko, Valentyn Sobchuk
Integro-Differential Models of Decision Support Systems for Controlling Unmanned Aerial Vehicles on the Basis of Modified Gradient Method 94

V. L. Timchenko, D. O. Lebedev
Automated Algorithmic Procedure of Robust-Optimal Control System's Synthesis for Marine Vehicles 98

M. Lykholit, O. Derevynska, M. Chernyak
Experimental Investigation of Navigation Compensating Pendulous Accelerometer's Metrological Performance 102

Vitalii Budashko, Valerii Shevchenko
Synthesis of the Management Strategy of the Ship Power Plant for the Combined Propulsion Complex 106

Nataliia Punchenko, Valentina Solodka, Oleksandra Tsyra, Mariya Levkovska, Galyna Kovalova
The Strategy of Informative Redundancy of Necessary Measurements in the Ship Navigation as the Independent Direction in the Development of a High Tech Park 110

S. Osadchy, V. Zubenko, M. Fedotova
Synthesis of an Optimal Stochastic Stabilization System for an Unstable Multivariable Object with Time Delays in Controls 114

A. E. Klochan, V. S. Kharuta, Ali Al-Ammouri, L. V. Osipa
Local Polarimetric Aviation Navigation System 119

Y. N. Bezkorovainyi, O. A. Sushchenko
Improvement of UAV Positioning by Information of Inertial Sensors 123

O. A. Sushchenko, Y. N. Bezkorovainyi, N. D. Novytska, K. Shafran
Design of Robust Controller for UAV with Redundant Inertial Sensors 127

O. M. Tachinina, O. I. Lysenko, I. V. Alekseeva, A. M. Tureichuk
Algorithm of Stabilization of UAV on a Given Trajectory of Motion with Allowance for Possible Retargeting 132

Victor Sineglazov, Oleksii Kizitskyi
Angular Quadcopter Stabilization while Execution an Energy Audit Task 135

Y. A. Opanasiuk
Inertial Measurement Unit and External Influence Duration 139

Igor Sergeyev
Error Analysis of the Measuring Converter due to Imperfections of its Blocks 143

O. A. Sushchenko, V. O. Golitsyn, O. P. Krivonosenko, S. D. Egorov
Improvement of Inertial Sensors for Using in Stabilization Systems 147

Session C. Tests of Navigation Systems, Aviation Simulators and Navigation Equipment

Arkadiy Prodeus, Igor Kotvytskyi, Anton Ditiashov
Clipped Speech Signals Quality Estimation 151

V. Tikhonov, V. Zakharchenko, N. Sokolova, S. Tovkach
Mathematical Model of the Electrical Power Storage Device the Dynamic Uninterrupted Power Source for the Ground Navigation Equipment 156

Maksym Yastrub, Svetlana Kredentsar
Enterprise Architecture as a Driver of Transformation in Air Traffic Management 162

V. M. Vasyliev, D. V. Vasyliev, K. V. Naumenko
Double Optimal Processing of Multilateration Surveillance System Measurements to Improve Aircraft Tracking 166

Yuliya Sikirda, Tetiana Shmelova, Dmytro Tkachenko
Automated System for Evaluation of the Organizational Risk Factors Influence on Flight Safety in Air Traffic Control 171

Bohgan Blagitko, Yuriy Mochulsky
Ensuring the Safe Landing of the Quadrocopter in an Accident 175

V. V. Konin, O. V. Kutsenko, E. O. Lukianenko, S. I. Ilnytska
Experimental Investigation of Multi-GNSS in Static Mode 179

S. Osadchy, A. Tymoshenko
The Decision Making Model for Weight Loss and Centering 183

S. V. Revenko, A. A. Omelchuk, Yu. O. Lebedenko, D. O. Dmitriev
Simulator of Motion of Wireframe Construction of Spatial Layout 187

Y. V. Hryshchenko, V. G. Romanenko, D. M. Pipa
Evaluation of Quality and Accuracy of Flight Path During Approach and Landing 191

Sergey Lienkov, Oleksandr Sieliukov, Evgen Lienkov, Igor Tolok, Vitaliy Loza
Evaluation of Radars Resolution Capability Using Simulation Mathematical Model 195

Vitalii F. Lysenko, Yurii A. Gunchenko, Sergey A. Shvorov, Sergey V. Lenkov, Svitlana D. Kuznichenko, Evgeny S. Lenkov
Methodological Bases of Construction of Intensive Training Flight Simulators of Aircrews ... 198

V. M. Sineglazov, E. V. Daskal
Automated System for Determining the Position of Service Vehicles on the Territory of the Airfield 204

S. Tovkach, M. Kravchuk, T. Kravchuk
Power Efficient Combined Heat Supply System for Ground Navigation Equipment 207

Session D. Hardware and Software of Flight Control and Navigation Systems

Viktor Beregun, Oksana Harmash
Application of Cumulant Coefficients for Solving the Problems of Testing and Diagnostics in Control Systems 210

L. Ryzhkov
Complementary Filter Design for Attitude Determination 214

I. U. Kondratieva, H. V. Rudakova, O. V. Polyvoda
Using Acoustic Methods for Monitoring the Operating Modes of the Electric Drive in Mobile Objects 218

Roman Voliansky, Oleksander Sadovoi, Nina Volianska
Defining of Lyapunov Functions for the Generalized Nonlinear Object 222

Maksim Iavich, Sergiy Gnatyuk, Elza Jintcharadze, Yuliia Polishchuk, Roman Odarchenko
Hybrid encryption model of AES and ElGamal cryptosystems for flight control systems 229

Guchenko Mykola, Slavko Olena, Sokhin Natalia, Kostenko Pavlo
Some Properties of the Local Model of Controlled Process 234

A. L. Simanenkov, S. A. Rozhkov
Marine Internal Combustion Engine Mathematical Model 238

S. Tovkach
Power Fuzzy Approach for Decision Making Support in the Adaptive Control System of the Aviation Engine 242

Genadiy Zhyrov, Viktoria Khirkh-Ialan, Ihor Pampukha, Yurii Khlaponin
Methodology and Algorithm for Generalization of Spatial Database Content in Digital Map Data Employing GIS Technologies to Produce 1:100 000 Scale Maps 247

I. A. Machalin, I. Ye. Terentyeva, A. G. Taranenko, Ye. I. Gabrousenko
Method for Estimation the Veracity of Diagnosis of the Aircraft Navigation and Landing Radio-electronic Systems 250

A. V. Goncharenko
Active Systems Communicational Control Assessment in Multi-Alternative Navigational Situations 254

Andrew Godny, Victor Sineglazov
Integrated Navigation Complex Design System 258

M. I. Delas
Combined Symmetry of Exponential and Extreme Hyperbolic Distributions in Macrosystems 262

V. O. Maksymov, O. I. Yurchenko
Forecast of Demand for Aviation Maintenance and Air Navigation Specialists for the Next 20 Years 267

D. I. Bakhtiiarov, G. F. Konakhovych, O. Y. Lavrynenko
An Approach to Modernization of the Hat and COST 231 Model for Improvement of Electromagnetic Compatibility in Premises for Navigation and Motion Control Equipment .. 271

Denis Karabetsky, Viktor Sineglazov
Conceptual Design of Solar Power System 275

S. I. Ilnytska, V. M. Kondratyuk, Ye. V. Vyshnyakova, A. A. Tunik
Experimental Investigation of Multi-GNSS in Static Mode 279

Zohaib Hassan, Shahzeb, Roman Odarchenko, Sergiy Gnatyuk, Abnash Zaman, Masroor Shah
Detection of Distributed Denial of Service Attacks Using Snort Rules in Cloud Computing & Remote Control Systems 283

Author Index 289