

1st IFAC Conference on Modelling, Identification and Control of Nonlinear Systems (MICNON 2015)

IFAC PapersOnline Volume 48, Issue 11

Saint Petersburg, Russia
24-26 June 2015

Part 1 of 2

Editors:

**Alexey Bobtsov
Anton Pyrkin**

**Sergey Kolyubin
Alexander Fradkov**

ISBN: 978-1-5108-1820-0

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© (2015) by Elsevier Limited
All rights reserved.

Printed by Curran Associates, Inc. (2016)

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: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

V. A. Yakubovich -Mathematician, "Father of the Field", and Herald of Intellectual Democracy in Science and Society	1
<i>S. Abramovich, N. V. Kuznetsov, G. A. Leonov</i>	
Robust Nonlinear Attitude Stabilization of a Spacecraft through Digital Implementation of an Immersion & Invariance Stabilizer	4
<i>G. Mattei, S. Monaco, D. Normand-Cyrot</i>	
Design of Path Following Method for Unmanned Aerial Vehicles using Normal Forms	10
<i>Sergey B. Tkachev, Wei Liu</i>	
In-Flight Identification of Magnetometer and Attitude Determination System for Land-survey Mini-satellite	16
<i>Yevgeny Somov, Sergey Butyrin, Chingiz Hajiyev</i>	
Control Design by Extended Linearisation Techniques for a Two Degrees of Freedom Helicopter	22
<i>Saif S. Butt, Hao Sun, Harald Aschemann</i>	
Processing and Forecasting the Trajectory of a Thrown Object Measured by the Stereo Vision System	28
<i>Konstantin Mironov, Irina Vladimirova, Martin Pongratz</i>	
Modelling of Dynamics of the Hiller Hub for a Small Helicopter	36
<i>Andrey E. Barabanov</i>	
Nonlinear Trajectory Tracking Control for Heavy-Haul Trains	41
<i>Bing Zhu, Xiaohua Xia</i>	
Commparation Between Different Methods of Control of Ball and Plate System with 6DOF Stewart Platform	47
<i>Aghiad Kassem, Hassan Haddad, Chadi Albitar</i>	
Observer Design for an Electromagnetically Actuated Dry Clutch	53
<i>Martin Steinberger, Jakob Rehrl, Martin Kirchengast, Markus Reichhartinger, Stefan Laimgruber, Daniel Prix, Martin Horn</i>	
Identification and Position Control of an Electromagnetic Clutch Actuator	59
<i>Martin Kirchengast, Martin Steinberger, Stefan Laimgruber, Daniel Prix, Martin Horn</i>	
Comparative Study on Direct Torque Control of Interior Permanent Magnet Synchronous Motor for Electric Vehicle	65
<i>Weijie Lin, Dongliang Liu, Qiuxuan Wu, Qiang Lu, Lili Cui, Jian Wang</i>	
Water Distribution Network Modeling Based on NARX	72
<i>Xu Zhe, Yang Jie, Cai Huaqiang, Kong Yaguang, He Bishi</i>	
Dynamical Modeling for Electric Hot Water Tanks	78
<i>Nathanael Beeker, Paul Malisani, Nicolas Pettit</i>	
Optimization of a Vacuum Thermal Evaporation Process Through Model-based Predictive Control of the Source Temperature	86
<i>D. Zöllner, M. Reiter, D. Abel</i>	
Complex Hydraulic Network Dispatching Control Based on Signal-Oriented Macromodel	N/A
<i>L. S. Kazarinov, D. A. Shnayder, T. A. Barabasova, O. V Kolesnikova</i>	
Object-Oriented Modeling of a Multi-Pass Shell-and-Tube Heat Exchanger and its Application to Performance Evaluation	97
<i>Javier Bonilla, Margarita M. Rodríguez-García, Lidia Roca, Loreto Valenzuela</i>	
Stabilization of Affine Systems with Control Singularities	103
<i>Alexey E. Golubev, Alexander P. Krishchenko, Nadezhda V. Utkina</i>	
Remarks on a Triangular Form for 1-Flat Pfaffian Systems with Two Inputs	109
<i>Bernd Kolar, Markus Schöberl, Kurt Schlacher</i>	
Lyapunov-Meyer Functions and Distance Measure from Generalized Fisher's Equations	115
<i>Yuri Pykh</i>	
A Generalized Piecewise Quadratic Lyapunov Function Approach to Estimating the Domain of Attraction of a Saturated System	120
<i>Yuanlong Li, Zongli Lin</i>	
Extremum Seeking with Drift	126
<i>Jan Maximilian Montenbruck, Hans-Bernd Dürr, Christian Ebenbauer, Frank Allgöwer</i>	
A Jet Space Approach to Derive Flat Outputs	131
<i>K. Schlacher, M. Schöberl, B. Kolar</i>	
Control of Nonlinear Elastic Joint Robots using Feed-forward Torque Decoupling	137
<i>Michael Ruderman, Makoto Iwasaki</i>	

Simple Robust and Adaptive Tracking Control for Mobile Robots	143
<i>Anton A. Pyrkin, Alexey A. Bobtsov, Sergey A. Kolyubin, Maxim V. Faronov, Oleg I. Borisov, Vladislav S. Gromov, Sergey M. Vlasov, Nikolay A. Nikolaev</i>	
Geometric Path Following Control in a Moving Frame	150
<i>Jian Wang, Iurii A. Kapitaniuk, Sergey A. Chepinskiy, Dongliang Liu, Aleksandr J. Krasnov</i>	
An Integrated Control-structure Design for Manipulators with Flexible Links	156
<i>Guaraci Bastos Jr., Olivier Brüls</i>	
Locomotion Control of Snake-like Robot on Geometrically Smooth Surface	162
<i>Takeru Yanagida, Makito Kasahara, Masami Iwase</i>	
Generalized Minimum Projection Method and Its Application to Two Wheeled Mobile Robot Control	168
<i>Hisakazu Nakamura</i>	
Power Control for Efficient Operation of a PEM Fuel Cell System by Nonlinear Model Predictive Control	174
<i>C. Hähnel, V. Aul, J. Horn</i>	
Multiple Model Predictive Control Based on Fuzzy Switching Scheme of a Coagulation Chemical Dosing Unit for Water Treatment Plants	180
<i>Oladipupo Bello, Yskandar Hamam, Karim Djouani</i>	
A pseudo-Port-Hamiltonian Representation and Control of a Continuous Bioreactor	186
<i>Jean-Yves Dieulot, Mohit Makkar</i>	
Robust Nonlinear Model Predictive Control for Regulation of Microalgae Culture in a Continuous Photobioreactor	192
<i>S. E. Benattia, S. Tebbani, D. Dumur</i>	
Nonlinear Insulin to Carbohydrate Rule for Treatment of Type 1 Diabetes	198
<i>Graham C. Goodwin, Diego S. Carrasco, Adrian M. Mediolì, Bruce R. King, Carly Stephen</i>	
Model-Based Optimal Control of Polymeric Composite Cure in Autoclave System	204
<i>Ilya V. Tarasov, Sergey N. Shevtsov, Alexander V. Evlanov, Emil E. Orozaliev</i>	
Adaptive Control of Aircraft Lateral Movement in Landing Mode	211
<i>Igor Furtat, Kseniya A. Khvostova, Denis A. Khvostov</i>	
Adaptive Control for the PVTOL System via Minimum Projection Method	216
<i>Soki Kuga, Hisakazu Nakamura, Ysuyuki Satoh</i>	
Passification Based Signal-parametric Adaptive Controller for Agents in Formation	222
<i>Boris Andrievsky, Stanislav Tomashevich</i>	
A Control Design for Quad Rotor UAVs with Input Unmodeled Dynamics	227
<i>Prashanth Krishnamurthy, Farshad Khorrani</i>	
Recursive Identification of Motion Model Parameters for Ultralight UAV	233
<i>Konstantin Amelin, Stanislav Tomashevich, Boris Andrievsky</i>	
Kalman—Yakubovich—Popov Lemma And Hilbert's 17th Problem	238
<i>Sergei V. Gusev</i>	
An Extended Kalman-Yakubovich-Popov Lemma for Positive Systems	242
<i>Anders Rantzer</i>	
A New Extension of the Infinite-dimensional KYP Lemma in the Coercive Case	246
<i>Anton V. Proskurnikov</i>	
IQC Arguments for Analysis of the 3-state Moore-Greitzer Compressor System	252
<i>A. S. Shiriaev, L. B. Freidovich, A. Robertsson, A. Andersson, R. Johansson</i>	
Adaptive Absolute Stability	258
<i>A. L. Fradkov, M. M. Lipkovich</i>	
Infinite-Time Optimal Control of Nonlinear Continuous-Time Systems with Nonlinear Feedback Gains	264
<i>Jakub Bernat, Slawomir Stepień, Paulina Superczyńska</i>	
Convergence Results of Galerkin Optimal Control with Legendre Test Function	268
<i>Randy Boucher, Wei Kang</i>	
Nonlinear Output Feedback H_∞-Control of Mechanical Systems Under Unilateral Constraints	274
<i>O. E. Montano, Y. Orlov, Y. Aoustin</i>	
Sensorless Nonsmooth H_∞-Tracking Synthesis of Servosystems with Backlash and Coulomb Friction	N/A
<i>Israel U. Ponce, Yury Orlov, Luis T. Aguilar, Joaquin Alvarez</i>	
Approximate Optimal Control by Inverse CLF Approach	286
<i>Hannes Rohrweck, Thomas Schwarzgruber, Luigi Del Re</i>	
Taylor Series Method for Continuous Linear-Quadratic Regulators	292
<i>V. N. Latypov, S. V. Sokolov</i>	
Output Control Algorithms of Dynamic Positioning and Disturbance Rejection for Robotic Vessel	295
<i>Jian Wang, Anton A. Pyrkin, Alexey A. Bobtsov, Oleg I. Borisov, Vladislav S. Gromov, Sergey A. Kolyubin, Sergey M. Vlasov</i>	

Flux and Position Observer of Permanent Magnet Synchronous Motors with Relaxed Persistency of Excitation Conditions	301
<i>Stanislav Aranovskiy, Alexey A. Bobtsov, Anton A. Pyrkın, Romeo Ortega, Antoine Chaillet</i>	
Oscillations and Friction Compensation in Two-Mass Drive System with Flexible Shaft by Command Filtered Adaptive Backstepping	307
<i>Jacek Kabzifski</i>	
Controlled Passage through Resonance for Two-Rotor Vibration Unit: Influence of Drive Dynamics	313
<i>Dmitry V. Gorlatov, Dmitry A. Tomchin, Olga P. Tomchina</i>	
Adaptive Zooming Strategy in Discrete-time Implementation of Sliding-mode Control	319
<i>Boris Andrievsky, Alexey Andrievsky, Iuliia Zaitceva</i>	
Sampled-Data Nonlinear Observer Design for Sensorless Synchronous PMSM	327
<i>A. A. R. Al Tahir, A. El Magri, T. Ahmed-Ali, A. El Fadili, F. Giri</i>	
Velocity Estimation of Valve Movement in Oysters for Water Quality Surveillance	333
<i>Hafiz Ahmed, Rosane Ushirobira, Denis Efimov, Damien Tran, Jean-Charles Massabuau</i>	
The Effect of the Local Filter Adjustment on the Accuracy of Federated Filters	339
<i>Viktor A. Tupysev, Yuliya A. Litvinenko</i>	
On Stability of Tunable Linear Time-Varying Band-Pass Filters	345
<i>Jian Wang, Stanislav Aranovskiy, Alexey A. Bobtsov, Anton A. Pyrkın, Polina A. Gritcenko</i>	
An H_{∞} Technology for Control of the Integrity of the Kalman Type of Estimating Filters with the Use of Adaptive Robust Procedures	348
<i>Alexander V. Chernodarov</i>	
Echo State Neural Network Based State Feedback Control for SISO Affine Nonlinear Systems	354
<i>Tarek A. Mahmoud, Lamiaa M. Elshenawy</i>	
On Stabilization of Switched Linear MI Systems Using in Part Common Left Eigenvector Assignment Based on LMIs	360
<i>D. Krokavec, A. Filasová, V. Serbák</i>	
Experimental Identification of Uncertainties in Dynamics of PWM Buck Converter	366
<i>Yury V. Kolokolov, Anna V. Monovskaya</i>	
A New Anisotropy-Based Control Design Approach for Descriptor Systems Using Convex Optimization Techniques	372
<i>Alexey A. Belov, Olga G. Andrianova</i>	
Randomized Stochastic Approximation under Unknown but Bounded External Noise and It's Application to a Control of Educational Processes	378
<i>Oleg Granichin, Olga Granichina, Sergey Trapitsin</i>	
Automatic Synthesis of Control for Multi-Agent Systems with Dynamic Constraints	384
<i>Askhat I. Diveev, Elizaveta Yu. Shmalko</i>	
Reliable Sliding Mode Approaches for the Temperature Control of Solid Oxide Fuel Cells with Input and Input Rate Constraints	390
<i>Andreas Rauh, Luise Senkel, Harald Aschemann</i>	
A Review of Research on Dynamics of Impulsive Control Systems: The Impact of V. A. Yakubovich	396
<i>Arkadii Kh. Gelig, Alexander N. Churilov, Alexander I. Shepeljavyi</i>	
From Conservation Laws to Wave Propagation and Back -dynamics and Control in Combined Heat/electricity Generation	402
<i>Vladimir Râsvan</i>	
Discontinuous Differential Equations: Comparison of Solution Definitions and Localization of Hidden Chua Attractors	408
<i>G. A. Leonov, M. A. Kiseleva, N. V. Kuznetsov, O. A. Kuznetsova</i>	
The Yakubovich Quadratic Criterion, F-Stability and Multi-agent Consensus	414
<i>Anton V. Proskurnikov</i>	
Global Tracking Passivity-based PI Control of Bilinear Systems and its Application to the Boost and Modular Multilevel Converters	420
<i>R. Cisneros, M. Pirro, G. Bergna, R. Ortega, G. Ippoliti, M. Molinas</i>	
An Approach to Analysis and Stabilization of Takagi-Sugeno Fuzzy Control Systems Via Superstability Conditions	426
<i>Yuri V. Talagaev</i>	
Robust Quadratic Stabilization of Bilinear Control Systems	434
<i>Mikhail V. Khlebnikov</i>	
State Estimation and Stabilization of Continuous Systems with Sector Nonlinearities and Bounded Disturbances	440
<i>Alexander I. Malikov</i>	
Energy Transfer in Two-Level Quantum Systems via Speed Gradient-Based Algorithm	446
<i>Alexander Pechen, Sergey Borisenok</i>	

Novel Robust Control of Hydrogenerator: The Synergetic Approach	451
<i>A. A. Kuz'Menko, A. A. Kolesnikov, D. A. Kolesnitchenko</i>	
Synergetic Design of Autopiloting Systems with Complex Optimization of Train Traction	457
<i>A. N. Popov, I. A. Radionov, A. S. Mushenko</i>	
Zero-Sum Nonlinear Polynomial Game for Planar Robots Coordination	N/A
<i>Manuel Jiménez-Lizárraga, Ricardo Chapa, Celeste Rodriguez, Pedro Castillo-Garcia</i>	
Achieving Perfect Tracking in Presence of Saturationplant model and Model Uncertainty in Current Regulators for Voltage Source Inverters	469
<i>Galina Mirzaeva, Graham Goodwin</i>	
Decentralized Disturbance Attenuation Control for Multi-Machine Power System	476
<i>Wei Wang, Hiromitsu Ohmori</i>	
Nonlinear Processing of Accelerometer and Magnetometer Measurements for Vehicles Monitoring	484
<i>Dmitrii Obertov, Boris Andrievsky, Sergey N. Sharov</i>	
The Speed Bi-gradient Method for Model Reference Adaptive Control of Affine Cascade Systems	489
<i>Yury I. Myshlyayev, Alexander V. Finoshin</i>	
Adaptive Properties of the Hermite Splines	496
<i>Yu. K. Dem'Yanovich</i>	
Universal Robust Adaptive Control of Robot Manipulators Using Real Time Estimation	499
<i>Qi Guo, Wilfrid Perruquetti, Denis Efimov</i>	
On the influence of Filter Choice in Output-Feedback MRAC during Adaptation Transients	505
<i>Jonas Missler, Dieter Schwarzmann, Liron Allerhand</i>	
Simple Adaptive and Robust Control for a Class of Time-varying Systems	511
<i>Dmitry N. Gerasimov, Maria V. Lyzlova, Vladimir O. Nikiforov</i>	
Adaptive Discrepancy Based Control of Particulate Processes	517
<i>Stefan Palis</i>	
About Disconnected Topology and Cluster Consensus	521
<i>Giacomo Casadei, Claudio De Persis, Lorenzo Marconi</i>	
Synchronization of Dynamic Network Subjected to Control Input Saturation	527
<i>Igor B. Furtat, Julia V. Chugina</i>	
A Comparative Study of Persistence Based Convergence Rate Estimates to Consensus	534
<i>Nilanjan Roy Chowdhury, Srikant Sukumar</i>	
Cucker-Smale Flocking Under General Interaction Topologies	540
<i>Jiu-Gang Dong, Li Qiu</i>	
A Consensus Algorithm Based on Nearest Second-order Neighbors' Information	545
<i>C. Chen, B. Zhang, Q. Lu, Q. Wu, J. Wang, S. Liu</i>	
From LQR Design to Nonconvex Global Optimization: Homage to Contribution and Impact of V.A. Yakubovich	551
<i>Alexey S. Matveev</i>	

VOLUME 2

Universal controllers of V.A. Yakubovich: A Systematic Approach to LQR Problems with Uncertain External Signals	557
<i>Anton V. Proskurnikov</i>	
Adaptive Stabilization of Minimum-Phase Plant under Lipschitz Uncertainty via Yakubovich's Method of Recurrent Objective Inequalities	563
<i>Victor F. Sokolov</i>	
Modifications of Finitely-Converging Algorithms of Adaptive Control	568
<i>Vladimir A. Bondarko</i>	
Stabilization of Option Price Dynamics Through Feedback Control of the Black-Scholes PDE	574
<i>Gerasimos G. Rigatos</i>	
Stability of Zonal Flows on a Sphere	581
<i>Yuri N. Skiba</i>	
Stability Properties of a Heat Equation with State-dependent Parameters and Asymmetric Boundary Conditions	587
<i>Christoph Josef Backi, Jan Dimon Bendtsen, John Leth, Jan Tommy Gravdahl</i>	
Distributed Event-triggered Control of Transport-Reaction Systems	593
<i>Anton Selivanov, Emilia Fridman</i>	
Robust Control of Continuous Crystallization Processes	598
<i>Rostyslav Geyyer, Achim Kienle, Stefan Palis</i>	

Asymptotic Properties of Nonlinear Singularly Perturbed Volterra Equations	604
<i>Vera B. Smirnova, Ella E. Pak, Anton V. Proskurnikov, Natalia V. Utina</i>	
Robust Decentralized Supervisory Control in a Leader-Follower Configuration with Obstacle Avoidance	610
<i>M. Guerra, D. Efimov, G. Zheng, W. Perruquetti</i>	
Distributed Consensus for Multiple Rigid-Bodies Based on Unit Dual Quaternion	616
<i>Yingju Wang, Renquan Lu, Jianzhong Wang, Anke Xue</i>	
Output Feedback Control of Wind Energy Conversion System with Hybrid Excitation Synchronous Generator	622
<i>H. Chakir, H. Ouadi, F. Giri</i>	
Decentralized Control for Self-Deploying Robotic Networks: Sweep Boundary Coverage	628
<i>Anna A. Semakova, Kirill S. Ovchinnikov, Alexey S. Matveev</i>	
An Isothermal Energy Function State Space Model of a Stirling Engine	634
<i>Carl Mueller-Roemer, Peter E. Caines</i>	
On the Effect of Correcting the Electro-hydraulic Servo Drive on the Dynamic Characteristics of the Servo Rive-Mass System of an Airplane	640
<i>Leonid A. Igumnov, Vladimir S. Metrikin</i>	
On the Stability and Robustness of Stuart-Landau Oscillators	645
<i>Elena Panteley, Antonio Loria, Ali El Ati</i>	
Frequency Analysis of Parametrically Controlled Oscillating Systems	651
<i>Anton V. Mandrik, Leonid S. Chechurin, Sergey L. Chechurin</i>	
A Simple Dynamical Model of Hydropower Plant: Stability and Oscillations	656
<i>G. A. Leonov, N. V. Kuznetsov, E. P. Solovyeva</i>	
Reducing the Modeling Error by Observer Based PID Regulators for a Class of Factorable Nonlinear Plants	662
<i>L. Keviczky, Cs. Bányász</i>	
Optimal Static Network Load Balancing Using Parametric Flow Approach	668
<i>Nikolai V. Malkovskii</i>	
On the Exact Steering of Finite Sampled Nonlinear Dynamics with Input Delays	674
<i>Lorenzo Ricciardi Celsi, Raffaello Bonghi, Salvatore Monaco, Dorothee Normand-Cyrot</i>	
Estimation of Sampling Interval Based on Churilova's Circle Criterion Systems with Time-varying Delay	680
<i>Tatiana A. Bryntseva</i>	
Sampled-Data Control of Nonlinear Systems Based on Fridman's Analysis and Passification Design	685
<i>Ruslan E. Seifullaev, Alexander L. Fradkov</i>	
Control Over Internet with Timecheck Denial Gain	691
<i>Mikhail S. Ananyevskiy</i>	
Experiment on Parameter Identification of a Time Delay Coupled Nonlinear System	694
<i>X. X. Zhang, J. Xu, S. Zhang, Y. Huang</i>	
Hidden Oscillations in Drilling Systems with Salient Pole Synchronous Motor	700
<i>M. A. Kiseleva, N. V. Kondratyeva, N. V. Kuznetsov, G. A. Leonov</i>	
A Short Survey on Pyragas Time-delay Feedback Stabilization and Odd Number Limitation	706
<i>N. V. Kuznetsov, G. A. Leonov, M. M. Shumafov</i>	
Rigorous Mathematical Definitions of the Hold-in and Pull-in Ranges for Phase-locked Loops	710
<i>N. V. Kuznetsov, G. A. Leonov, M. V. Yuldashev, R. V. Yuldashev</i>	
Response of Costas PLL in the Presence of In-band Interference	714
<i>M. Al-Aboodi, N. V. Kuznetsov, G. A. Leonov, M. V. Yuldashev, R. V. Yuldashev</i>	
Pull-in Range of the PLL-based Circuits with Proportionally-integrating Filter	720
<i>Konstantin D. Alexandrov, Nikolay V. Kuznetsov, Gennady A. Leonov, Pekka Neittaanmäki, Svetlana M. Seledzhi</i>	
Modeling and Identification of the Tunisian Social System in 2011-2014: Bifurcation, Revolution, and Controlled Stabilization	725
<i>G. A. Leonov, E. V. Kudryashova, N. V. Kuznetsov</i>	
Output Stabilization for a Class of Nonlinear Systems Via High-gain Observer with Limited Gain Power	730
<i>Lei Wang, Daniele Astolfi, Hongye Su, Lorenzo Marconi, Alberto Isidori</i>	
The Theory of Trajectory Tubes for the Problem of Output Feedback Tracking Control	736
<i>Alexander B. Kurzhanski, Pavel A. Toichilin</i>	
Global Optimal Output Regulation of Partially Linear Systems via Robust Adaptive Dynamic Programming	742
<i>Weinan Gao, Zhong-Ping Jiang</i>	

High-gain Fractional-order Controller for Output Tracking and Disturbance Attenuation in a Class of Lur'e Systems.....	748
<i>Giuseppe Fedele, Gaetano D'Aquila</i>	
Design of PD Observer-Based Fault Estimator for a Class of Takagi-Sugeno Descriptor Systems.....	754
<i>D. Krokavec, A. Filasová</i>	
MIMO Tracking PI/PID Controller Design for Nonlinear Systems based on Singular Perturbation Technique.....	760
<i>Valery D. Yurkevich</i>	
Preservation and Interconnection of iISS and ISS Dissipation Inequalities by Scaling.....	766
<i>Hiroshi Ito, Christopher M. Kellett</i>	
Equivalences of Stability Properties for Discrete-Time Nonlinear Systems.....	772
<i>Duc N. Tran, Christopher M. Kellett, Peter M. Dower</i>	
Class Library in C++ to Compute Lyapunov Functions for Nonlinear Systems.....	778
<i>Jóhann Björnsson, Skuli Gudmundsson, Sigurdur Hafstein</i>	
Dissipativity of Nonlinear 2D Systems.....	784
<i>Julia Emelianova, Mikhail Emelianov, Pavel Pakshin, Krzysztof Galkowski, Eric Rogers</i>	
Necessary Conditions for 2D Systems' Stability.....	790
<i>Vladimir Pozdyayev</i>	
Lyapunov Function Verification: MATLAB Implementation.....	796
<i>Skuli Gudmundsson, Sigurdur F. Hafstein</i>	
Conditionally Minimax Prediction in Nonlinear Stochastic Systems.....	802
<i>A. V. Bosov, A. V. Borisov, K. V. Semenikhin</i>	
Identification of Sensor Errors by Using of Nonlinear Filtering.....	808
<i>O. A. Stepanov, A. V. Motorin, V. A. Vasilyev</i>	
Application of Rank-Constrained Optimisation to Nonlinear System Identification.....	814
<i>Ramón A. Delgado, Juan C. Agüero, Graham C. Goodwin, Eduardo M. A. M. Mendes</i>	
Decomposition Synthetic Approach for Optimum Nonlinear Estimation.....	819
<i>Oleg S. Amosov, Svetlana G. Baena</i>	
Constructing Consistent in the Rényi Sense Measures of Dependence within System Identification.....	825
<i>K. R. Chernyshov</i>	
Identification of Polynomial Wiener Systems via Volterra-Laguerre Series with Model Mismatch.....	831
<i>Daniel Jansson, Alexander Medvedev</i>	
Modelling and Control of Actuators with Built-in Position Controller.....	837
<i>Zilong Shao, Gang Zheng, Denis Efimov, Wilfrid Perruquetti</i>	
Robust Control of Uncertain Linear Systems in Conditions of Output Quantization.....	843
<i>Alexey Margun, Igor Furtat</i>	
Soft Controller Switching with Guaranteed H_∞ Performance.....	848
<i>Liron I. Allerhand, Uri Shaked</i>	
Tracking Control of PWM Non-affine Nonlinear Systems via Singular Perturbation Approach.....	854
<i>Valery D. Yurkevich</i>	
Lyapunov-design for a Super-twisting Sliding-mode Controller Using the Certainty-Equivalence Principle.....	860
<i>Alexander Barth, Markus Reichhartinger, Johann Reger, Martin Horn, Kai Wulff</i>	
Higher-Order Sliding-Mode Control for Binary Input by Using Implicit Lyapunov Function.....	866
<i>Ryo Nonaka, Yuh Yamashita, Daisuke Tsubakino</i>	
Hybrid Output Controller for Biased and Time-Varying Periodic Disturbances Rejection.....	872
<i>Alexey A. Bobtsov, Sergey A. Kolyubin, Anton A. Pyrkin, Nikolay A. Nikolaev</i>	
On the Robust Stability of the Hill Equation with a Delay Term: A Frequency-Domain Approach.....	878
<i>Dmitry A. Altshuller</i>	
Third Order Splines and Solution of Delay Differential Equation.....	883
<i>I. G. Burova, A. S. Abdurakhimova</i>	
Control of Synchronization in Two Delay-coupled FitzHugh-Nagumo Systems with Heterogeneities.....	887
<i>Sergei A. Plotnikov</i>	
Output Adaptive Controller for a Class of MIMO Systems with Input Delay and Multisinusoidal Disturbance.....	892
<i>Jian Wang, Alexey A. Vedyakov, Anastasiia O. Vediakova, Anton A. Pyrkin, Alexey A. Bobtsov, Sergey V. Shavetov</i>	
Towards Integrability for Nonlinear Time-delay Systems.....	900
<i>Arvo Kaldmäe, Claude H. Moog, Claudia Califano</i>	
Feedback Linearization Control of Flexible Structures with Hysteresis.....	906
<i>Michael Ruderman</i>	
Gain-Scheduled MPC Design for Nonlinear Systems with Input Constraints.....	912
<i>Adrian Ilka, Vojtech Veselý</i>	

Trajectory Tracking for Nonholonomic Vehicles with Velocity Constraints	918
<i>Xiao Yu, Lu Liu, Gang Feng</i>	
Covering Method for Point-to-Point Control of Constrained Flat Systems	924
<i>Yu. S. Belinskaya, V. N. Chetverikov</i>	
Model Predictive Control for Constrained Uncertain, Time-varying Systems	930
<i>Hoai-Nam Nguyen, Per-Olof Gutman</i>	
Simultaneous Perturbation Stochastic Approximation in Decentralized Load Balancing Problem	936
<i>Natalia Amelina, Victoria Erofeeva, Oleg Granichin, Nikolai Malkovskii</i>	
Stochastic Gramians in the Problem of Controllability Quantitative Measuring for Continuous and Discrete Plants	942
<i>Dmitriy S. Biryukov, Natalia A. Dudarenko, Leonid A. Mironovskiy, Anatoliy V. Ushakov</i>	
Control of Linear Stochastic Systems with State Dependent Noise	946
<i>T. E. Duncan, B. Pasik-Duncan</i>	
Vertex-dependent Approach to Robust H_∞ Control and Estimation of Stochastic Discrete-time Systems	949
<i>E. Gershon, U. Shaked</i>	
Local Voting Protocol for Differentiated Consensuses in a Stochastic Network with Priorities	954
<i>N. Amelina, O. Granichin, O. Granichina, Y. Ivanskiy, Y. Jiang</i>	
Elegant Analytic Computation of Phase Detector Characteristic for Non-sinusoidal Signals	960
<i>N. V. Kuznetsov, G. A. Leonov, S. M. Seledzhi, M. V. Yuldashev, R. V. Yuldashev</i>	
Start-Up Peculiarities in Dynamics of Hysteresis Regulator with Double Synchronization	964
<i>Yury V. Kolokolov, Anna V. Monovskaya</i>	
Mathematical Modelling of Dynamics and Stability of Elastic Elements of Vibration Devices	970
<i>Petr A. Velmisov, Andrey V. Ankilov</i>	
On the Performance of a Digital Chaos-Based Communication System in Noisy Channels	976
<i>Greta A. Abib, Marcio Eisencraft</i>	
A New Algorithm for Construction of Quadratic Volterra Model for a Non-Stationary Dynamic System	982
<i>Svetlana Solodusha, Konstantin Suslov, Dmitry Gerasimov</i>	
On the Dynamics of Systems with Impact Interactions	988
<i>Vladimir S. Metrikin, Irina V. Nikiforova</i>	
Lyapunov Stability for Dynamical Systems Driven by Rough Paths	994
<i>Yūki Nishimura</i>	
Globally Stabilizing State Feedback Control Design for Lotka-Volterra Systems Based on Underlying Linear Dynamics	1000
<i>Attila Magyar, Katalin M. Hangos</i>	
Interconnection and Damping Assignment for Implicit Port-Hamiltonian Systems	1006
<i>Fernando Castaños, Dmitry Gromov</i>	
Minimum Projection Method for Asymptotic Stabilization of Compact Set	1012
<i>Hisakazu Nakamura, Yu Koyama</i>	
Brachistochrone Problem with Coulomb Friction and Viscous Drag: Qualitative Analysis	1018
<i>O. Yu. Cherkasov, A. V. Zarodnyuk</i>	
Stabilization of New Classes of Uncertain Systems	1024
<i>Maksim Zakharenkov, Irina Zuber, Arkadii Gelig</i>	
Nonlinear Control Systems Theory in Romania and the Influence of the Contributions of V. A. Yakubovich	1028
<i>Vladimir Râșvan</i>	
My Teacher	1033
<i>Alexander L. Fradkov</i>	
Excitation and Control of Autoresonance in an Oscillator Chain	1037
<i>Agnessa Kovaleva</i>	
Real-Time Compatible Phenomenological Modelling of the Austenitic Phase in Shape Memory Alloys as an Example for Modelling of Materials with Repeatable Non-Linear Characteristics	1043
<i>Arathi Pai, Ansgar Traeuchler, Mirko Schaper</i>	
Estimation of the TQ-complexity of Chaotic Sequences	1049
<i>A. V. Makarenko</i>	
Modified Backstepping Algorithm with Disturbances Compensation	1056
<i>Igor Furtat, Elena Furtat, Evgeny A. Tupichin</i>	
MRAC of Systems Subject to Actuator Nonlinearities and Unknown Time-varying State Delays: Tube Reference Approach	1062
<i>Boris Mirkin, Per-Olof Gutman, Yuri Shtessel</i>	

Robust Switched Controller Design for Nonlinear Continuous Systems	1068
<i>Vojtech Vesely, Adrian Ilka</i>	
Digital Stabilization of Strict Feedback Dynamics Through Immersion and Invariance	1074
<i>M. Mattioni, S. Monaco, D. Normand-Cyrot</i>	
Design Degrees of Freedom in a Hybrid Observer for a Continuous Plant under an Intrinsic Pulse-modulated Feedback	1080
<i>Diana Yamalova, Alexander Churilov, Alexander Medvedev</i>	
The Shortest Path Construction Method between Nodes in a Stochastic Network	1086
<i>Iliia Kirianovskii</i>	
Analytical Stochastic Model of Traffic	1090
<i>Serge L. Shishkin</i>	
Estimating the Conditional Mean in Non-Linear Dynamic Systems: the Almost Sure Convergence	1098
<i>K. R. Chernyshov</i>	
Nonlinear Time-varying Systems Identification Based on Multi-dimensional Taylor Network and Variable Forgetting Factor Recursive Least Squares Algorithm	1103
<i>Jiao-Jun Zhang, Hong-Sen Yan</i>	
Partially Observable Multivariate Point Processes with Linear Random Compensators: Analysis and Filtering with Applications to Queueing Networks	1108
<i>Andrey V. Borisov</i>	
Author Index	