



**Contents of Volume 15, 2015**

<b>Volume 15</b>	<b>Number 1</b>	<b>March 2015</b>
Preface to the Special Issue: Experimental Approaches in Dynamical Analysis and Control of Mechanical Systems .....		1
Coupled Fractal Nanosystem: Trap – Quasi-two-dimensional Structure .....		4
<i>O.P. Abramova and S.V. Abramov</i>		
Differential Equations of Controlled Pneumatic Actuators for 6-DOF Stewart Platform .....		14
<i>B. Andrievsky, D.V. Kazunin, D.M. Kostygova, et al</i>		
The Duffing–Van der Pol Equation: Metamorphoses of Resonance Curves .....		25
<i>J. Kyziol and A. Okniński</i>		
Analytical and Experimental Investigation of Vertical Vibration of a Freight Wagon in the Presence of Mechanical Asymmetry .....		32
<i>F.N. Nangolo, J. Soukup, A. Petrenko and J. Skocilas</i>		
Researches Defining the Characteristics of Hyperelastic and Composite Materials with Gas Phase in the Vehicle–Pedestrian System .....		43
<i>J. Osinski and P. Rumianek</i>		
Mathematical Modeling of the Hydro-Mechanical Fluid Flow System on the Basis of the Human Circulatory System .....		50
<i>W. Parandyk, D. Lewandowski and J. Awrejcewicz</i>		
Six-Legged Robot Gait Analysis .....		63
<i>B. Stańczyk and J. Awrejcewicz</i>		
Constrained Motion of Mechanical Systems and Tracking Control of Nonlinear Systems: Connections and Closed-form Results .....		73
<i>Firdaus E. Udwadia and Harshavardhan Mylapilli</i>		
Transcritical-like Bifurcation in a Model of a Bioreactor .....		90
<i>J. Villa, G. Olivar and F. Angulo</i>		
Cooperation of One and Multi-Joint Muscles .....		99
<i>B. Zagrodny and J. Awrejcewicz</i>		
<b>Volume 15</b>	<b>Number 2</b>	<b>March 2015</b>
Parabolic Equations with Measure Data and Three Unbounded Nonlinearities in Weighted Sobolev Spaces .....		107
<i>Y. Akdim, J. Bennouna, M. Mekhour and H. Redwane</i>		
Asymptotic Stability Conditions for Some Classes of Mechanical Systems with Switched Nonlinear Force Fields .....		127
<i>A.Yu. Aleksandrov, E.B. Aleksandrova, P.A. Lakrisenko, et al</i>		
Global Stability of Phase Synchronization in Coupled Chaotic Systems .....		141
<i>M. Boutefnouchet, H. Taghvafard and G.H. Erjaee</i>		
A Fractional Order $PI^\alpha D^\beta$ Control of the Nonlinear Systems .....		148
<i>A. Ltifi, M. Ghariani, M. Kharrat and R. Neji</i>		
A New Synchronization Scheme for General 3D Quadratic Chaotic Systems in Discrete-Time .....		163
<i>Adel Ouannas</i>		
Initial Trajectories of Propagation of Fatigue Cracks Under Biaxial Cyclic Loading with Phase Difference .....		171
<i>V.Y. Perel and S. Mall</i>		
Delay Independent Stability of Co-operative and Supportive Neural Networks .....		184
<i>P. Raja Sekhara Rao, K. Venkata Ratnam and P. Lalitha</i>		

Generalized Iterative Methods for Caputo Fractional Differential Equations via Coupled Lower and Upper Solutions with Superlinear Convergence .....	198
<i>M. Sowmya and A.S. Vatsala</i>	
Peakons and Soliton Solutions of Newly Developed Benjamin-Bona-Mahony-Like Equations .....	209
<i>Abdul-Majid Wazwaz</i>	

**Volume 15** **Number 3** **March 2015**

The Problem of Stability by Nonlinear Approximation <i>to the 85th Birthday of Professor V.I. Zubov</i> .....	221
<i>A. Yu. Aleksandrov, A.A. Martynyuk and A.P. Zhabko</i>	
Mathematical Contributions to the Dynamics of the Josephson Junctions: State of the Art and Open Problems .....	231
<i>M. De Angelis</i>	
An Inversion of a Fractional Differential Equation and Fixed Points .....	242
<i>L.C. Becker, T.A. Burton and I.K. Purnaras</i>	
Mild Solution for Impulsive Neutral Integro-Differential Equation of Sobolev Type with Infinite Delay .....	272
<i>Alka Chadha</i>	
Effectiveness of the Extended Kalman Filter Through Difference Equations .....	290
<i>R. Jothilakshmi</i>	
Existence of Even Homoclinic Solutions for a Class of Dynamical Systems .....	298
<i>K. Khachnaoui</i>	
Estimating the Bounds for the General 4-D Continuous-Time Autonomous System .....	313
<i>Rezzag Samia, Zehrour Okba and Aliouche Abdelkrim</i>	
Approximate Controllability of Semilinear Stochastic Control System with Nonlocal Conditions ...	321
<i>Anurag Shukla, N. Sukavanam and D.N. Pandey</i>	

**Volume 15** **Number 4** **March 2015**

Synchronization of Dumbbell Satellites: Generalized Hamiltonian Systems Approach .....	221
<i>L. O. Arriaga-Camargo, R. Martínez-Clark, C. Cruz-Hernández, et al</i>	
Fuzzy Modeling and Robust Pole Assignment Control for Difference Uncertain Systems .....	231
<i>A. Aydi, M. Djemel and M. Chtourou</i>	
Direct Control of Matrix Converters Using Asymmetric Strategy (ASVM) to Feed the Double Star Induction Machine .....	242
<i>F. Bettache, M. Tadjine, L. Nezli and Tlemçani</i>	
Existence Results for a Fractional Integro-Differential Equation with Nonlocal Boundary Conditions and Fractional Impulsive Conditions .....	272
<i>Vidushi Gupta and Jaydev Dabas</i>	
Passive Kinematic Synchronization of Dissimilar and Uncoupled Rotating Systems .....	290
<i>I. Handžić, H. Muratagić and K.B. Reed</i>	
A New Approach to Synchronize Different Dimensional Chaotic Maps Using Two Scaling Matrices .....	298
<i>Adel Ouannas and M. Mossa Al-Sawalha</i>	
A Simple Analytical Technique to Investigate Nonlinear Oscillations of an Elastic Two Degrees of Freedom Pendulum .....	313
<i>Md. Abdur Razzak and Md. Helal Uddin Molla</i>	
Mathematical Analysis in a Model of Primary Succession .....	302
<i>R.V. Ruzich</i>	
Observer Based Output Tracking Control for Bounded Linear Time Variant Systems .....	321
<i>B. Iben Warrad, M.K. Bouafoura and N. Benhadj Braiek</i>	
Contents of Volume 15, 2015 .....	441