

Table of Contents

Preface

I Actuators, Sensors, Test Benches

The Influence of Supply Voltage Amplitude Variation Law on AC Induction Motor Efficiency in Variable-Speed Drive

V. Bleizgys and A. Baskys 1

The Feedback Control of Drives with Low Acceleration and Deceleration Rate of Motor

A. Baskys and V. Zlosnikas 5

Development of a Novel Micro-Actuator Driven by Shape Memory Alloy

C.H. Pan and Y.B. Wang 9

Design of Sensor System for the Linear Actuator of Stewart Platform

P. Houška and T. Březina 15

High Precision Mass Measurement in Automation

T. Ivanova and J. Rudzitis 19

Application of Non-Linear Correction Systems for Control of Work Movements of the Mobile Crane under a Threat of Stability Loss

J. Janusz and J. Kłosiński 25

Determination of Ability of Hydrotronic Systems to Start in Low Ambient Temperatures

R. Jasiński 31

Research of Hydrotronic Variable-Displacement Radial Piston Pump with Electro-Pneumatic Control

R. Jasiński 37

Calculation of Spectrum Characteristics for Braking Modes of Linear Induction Motors

B. Karaliunas and E. Matkevicius 41

Research of Influence of Vibrations on Calibration Quality of Line Scale Gauge

A. Kilikevičius, V. Vekteris, K. Slivinskas, A. Kasparaitis and S. Juraitis 47

Development of a Test Bench for SMA Wires

I. Lungu, D. Mândru and S. Noveanu 56

The Automation of Test Stand for Engine Cooling System Testing

K. Zbigniew and M. Śmieja 61

Energy-Saving Mechatronic System for Fatigue Tests of Materials under Variable-Amplitude Proportional Bending and Torsion

W. Macek and E. Macha 67

Mechatronic System for Automatic Inspection of Circular Saw Teeth

J. Kapcia, K.A. Orlowski and R. Wasielewski 73

Dynamics of Dust Explosion Localizing System

R. Rinkeviciene, A.J. Poška and A. Slepikas 79

Model of a Sensorless Induction Drive

R. Rinkevičienė, V. Batkauskas, A. Petrovas and S. Lisauskas 85

Improvement of Precise Angle Control System

S. Sakalinis and D. Udris 91

II Control of Mechatronic Systems

Implementation of the Type-2 Fuzzy Controller in PLC

I. Dominik 95

Verification of Multilayer Neural-Net Controller in Manipulator Tracking Control

W. Żylski and P. Gierlak 99

Control Algorithms in Mechatronic Systems with Parallel Processes

A. Gubarev, O. Yakhno and O. Ganpatsurova 105

Coordination of Rated Power of Wind Turbine with a Bar Graph of Wind Speed by Means of Flexible Control Algorithm of the Hydraulic Drive

A. Gubarev and O. Ganpatsurova 111

About Dynamics Problems of the Vibroisolation System with the Gyroscopic Stabilizer	116
J. Škliba and J. Škoda	
Optimum Control of Gyroscopic Systems	121
R. Hein and C. Orlikowski	
Influence of Dynamic Viscosity on Automatic Dynamic Balance	127
M. Bogdevicius and J. Janutėnienė	
High Resolution High Power Low Frequency Digital-to-Analog Converter	133
V. Puidokas and A.J. Marcinkevičius	
Self-Tuning Controller for Nonlinear Object	139
A. Nawrocka and J. Kwaśniewski	
The Correction and Compensation Motors for the Gyroscopic Stabilizer	145
R. Votrubec and M. Sivčák	
Selection of Method for Underwater Robot Control	149
P. Szymak	
RFID and Wireless Sensor and Actuator Networks in Advanced Production Applications	155
J. Tervonen, M. Luimula, S. Pieskä, T. Pitkähö and J. Alaspää	
Rowing Force Simulation and Control System	161
V. Grigas, A. Legha, A. Sulginas and R.T. Toločka	
Cyclic-Modular Approach for Simulation of Multi-Regime Mechatronic Systems with Hydraulic Components	165
O.V. Uzunov	
Control Method for Elimination of Self-Excited Oscillations during Turning	171
T. Březina, J. Vetiška, P. Blecha and P. Houška	

III Optimization, Optimal Design

Stewart Platform Model with Uncertain Parameters	177
L. Březina and T. Březina	
Port-Based Modeling of Distributed-Lumped Parameter Systems	183
C. Orlikowski and R. Hein	
Modal Reduction and Analysis of Gyroscopic Systems	189
C. Orlikowski and R. Hein	
Design of a Low-Cost Submicron Measuring Probe	195
G. Hermann	
Adaptation of the Expert System in Diagnosis of the Connection of the PLC User Interface System and A Field Level	201
J. Świdler and M.P. Hetmańczyk	
Monitoring of Velocity of Manufacturing Machines Subassemblies by Means of a DAQ System	207
W. Blacharski	
Virtual Prototyping Process Supported by New Diagnostic Method -Method of Metal Magnetic Memory	212
P. Hatłas, J. Juraszek and K. Krupa	
Phase Locked Loop Integrated System	221
J. Charlamov and R. Navickas	
A Reusable Agent-Based Framework for Smart Embedded Systems	227
E. Kazanavicius, V. Kazanavicius and L. Ostaseviciute	
Assembler Encoding versus Connectivity Matrix Encoding in the Inverted Pendulum Problem with a Hidden State	233
T. Praczyk	
Computer-Aided Analysis of Piezoelectric Plates	239
A. Buchacz and A. Wróbel	
Synthesis of Planetary Gears by Means of Artificial Intelligence Approach Graph-Theoretical Modeling	243
J. Drewniak and S. Zawiślak	
Modeling of Iron Wolf Howling	249
V. Slivinskas, V. Šimonytė and G. Pyž	

IV Analysis of Vibration

Passive and Active Elements in Reduction of Vibrations of Torsional Systems K. Białas	260
Sensorless Vibratory Manipulation of the Automatically Assembled Parts B. Bakšys, J. Baskutiene, A.B. Povilonis and K. Ramanuskytė	265
Parametrization of all Three Impulse Zero Vibration Input Shapers M. Schlegel and L. Bláha	271
Some Aspects of Bearing Noise Generation V. Bučinskas, S. Mirzaei and K. Kirchner	278
Simulation and Experiments of High Speed Machining Vibration Monitoring with Variable Spindle Velocity K.J. Kalinński and M.A. Galewski	285
Verification of Vibration Power Generator Model for Prediction of Harvested Power Z. Hadas, V. Singule and C. Ondrusek	291
Rigid Finite Element Modeling for Identification of Vibrations in Elastic Rod Driven by a DC-Motor Supplied from a Thyristor Rectifier K. Lipiński and Z. Kneba	297
Theoretical Analysis of Vibrations of a Mass Connected with a Support through a Chain of Elastic Elements A.H. Marcinkevičius	303
Research of Vibrations of a System with in Series Connected Elastic Elements Joining a Mass with a Support A.H. Marcinkevičius	308
Sensitivity and Stability Analysis of Mu-Synthesis AMB Flexible Rotor A. Mystkowski	313
Development of Mathematical Model of a Mechatronic System A. Buchacz and M. Płaczek	319
Selection of Parameters of External Electric Circuit for Control of Dynamic Flexibility of a Mechatronic System A. Buchacz and M. Płaczek	323
Dynamic Analysis of Vibrating Device A. Trąbka, L. Majewski and J. Kłosiński	327
Control of Two-Dimensional Vibrating System J. Kłosiński, L. Majewski and A. Trąbka	333
Dynamical Flexibility of Complex Damped Systems Vibrating Transversally in Transportation S. Zolkiewski	339
Numerical Application for Dynamical Analysis of Rod and Beam Systems in Transportation S. Zolkiewski	343
Attenuation-Frequency Characteristics of Beam Systems in Spatial Motion S. Zolkiewski	349
Detection of Defects in Steel Ropes Using Dynamical Methods V.K. Augustaitis, V. Bučinskas and R. Subačius	355

V Tribology

High Efficiency Radial Passive Magnetic Bearing K. Falkowski and M. Henzel	360
--	-----

VI Robotics

Modeling of Vertical Planar Two-Link Manipulator Z. Gosiewski and G. Michałowski	366
Movement Trajectory Planning Algorithm of Rotating Mobile Piezorobot R. Bansevičius, A. Drukteiniene and G. Kulvietis	371

Limb/Ground Impacts and Unexpected Impacts Control Strategy for a Model of a Walking Robot Limb	377
K. Lipiński	
Numerical Analysis and Experimental Research of a Compliant Minigripper	383
S. Noveanu, D. Mândru, I. Lungu and V.I. Csibi	
Advanced Tools for Multi-Body Simulation and Design of Control Structures Applied in Robotic System Development	387
T. Kubela, A. Pochyly and V. Singule	
Orthonormality and Spectral Analysis for Robotics and Astrodynamics	392
R.D. Rugescu, D. Mortari, S. Staicu and S. Aldea	
Universal Navigation Algorithm Planning Platform for Unmanned Systems	405
R. Sell and P. Leomar	
Optimization of Transport Movement Parameters of the Transfer Manipulator for the Quenching Bath According to the Technological Process Requirements	411
K. Slivinskas, V. Gichan, V. Striška and A.J. Poška	
Discrete Action Dependant Heuristic Dynamic Programming in Control of a Wheeled Mobile Robot	419
Z. Hendzel and M. Szuster	
In-Pipe Modular Robotic Systems for Inspection and Exploration	425
M.O. Tătar, A. Aluței and D. Mândru	
Research of Hexapod Robot Motion in Irregular Terrain	431
T. Luneckas and D. Udris	