

Table of Contents

Chapter 1: Materials and Processing Technologies for Mechatronic Systems

Magnetosensitive Polymer Composites and Effect of Magnetic Field Directivity on their Properties	
E. Dragašius, E. KOROBKO, Z. Novikava and E. SERMYAZHKO	3
Investigation of the Laser Polishing Influence on the Parts Built by SLS	
V. Markovič, Z.A. Mierzejewska, G. Vaitkūnaitė, S. INDRIŠIŪNAS, R. Lukauskaitė, O. Černašėjus and V. GOLUBEV	8
Investigation of Application Possibilities of Re-Ni Alloy Powder to Tungsten Heavy Alloys Production	
T. Majewski and K. LESZCZYŃSKA-SEJDA	14
Friction and Slip Property Investigation of Nanostructured Metal Surface Coatings	
J. Lungevics, J. Rudzitis, E. Gerins and A. Leitans	20
Experimental Investigation on the Friction Stir Spot Welding Process of Non-Ferrous Metals	
P. KRASAUSKAS, S. KILIKEVIČIUS, R. ČESNAVIČIUS and J. JALOVECKAS	25
Characteristics of Processing Water-Soluble Crystals	
R. VILKELIS, M. Jurevičius and I. ŠVAGŽDYTĖ	30
The Influence of the Specimen Shape on the Fatigue Life under Bending	
E. Marcisz and D. Rozumek	35
Simplified Method of Resin Infusion Process Simulation on Example of Formula Student Lightweight Components	
M. WNUK and A. Iluk	41

Chapter 2: Measurements and Nondestructive Testing

The Research of Wire Rope Defect Using Contactless Dynamic Method	
E. ŠUTINYS, V. Bučinskas and A. Dzedzickis	49
A Laboratory System to Testing Characteristics Wind Turbine at Low Speeds of Wind	
J. Spychała, P. Majewski and M. Żokowski	55
Model Based Determination of Gait Parameters Using IMU Sensor Data	
H. Loose and K. Orłowski	61
Review of Ultrasonic Signal Acquisition and Processing Techniques for Mechatronics and Material Engineering	
L. SVILAINIS	68

Chapter 3: Applied Research of Mechatronic Systems

Modelling of Mechanical Structure of Atomic Force Microscope	
A. Dzedzickis, V. Bučinskas, N. ŠEŠOK and I. ILJIN	77
Investigation of High Frequency Mechanical Vibrations in PMN-32%PT Crystals by Laser Interferometry	
R.J. KAZYS, R. SLITERIS, J. SESTOKE and M. ZIENIUS	83
Research of Frictional Force in Respect to Magnetized Surface	
I. Skiedraite, S.G. KRISHNAMOORTHY and A. KONDRATAS	89
FEM Investigation of Load Carrying Capacity of Magnetic Vibration Isolating Supports	
A. GEDVILA and V. Mokšin	94
Application of the Complementary Functions Method to an Accurate Elasticity Solution for the Radially Functionally Graded (FG) Rotating Disks with Continuously Variable Thickness and Density	
C. Boğa and V. YILDIRIM	100

A Combined Smart-Materials Approach for Next-Generation Airfoils J. Scheller, G. JODIN, K. RIZZO, E. Duhayon, J.F. Rouchon, M. TRIANTAFYLLOU and M. Braza	106
Improved Controller Performance for Electromechanical Axes H. Schlegel, A. Hellmich, K. Hipp, J. QUELLMALZ and R. Neugebauer	113
Flexible Tunable Interdigital Transducer for Lamb Wave Generation M. Mańka	120
Antagonistic Shape Memory Alloy Actuators in Soft Robotics T.S. Le, H. Schlegel, W.G. Drossel and A. Hirsch	126
The Problem of Negative Vibration Isolation in Various Discrete Mechatronic Systems A. Buchacz and D. Gałęziowski	133
Investigation of the Effect of Gravity Anomalies on the Precession Motion of Single Gyroscope Gravimeter I. KOROBICHUK, A. KOVAL, M. Nowicki and R. Szewczyk	139
Practical Solution for Temperature Control for Inertial Object J. Mężyk	146
Performance Index for Servo Drives under PI Speed Control J. QUELLMALZ, H. Schlegel, M. Rehm, H. KIRCHNER and R. Neugebauer	152
A Concept for Intelligent Tool Exchange System for Industrial Manipulators J. Mężyk	158
Unmanned Ground Vehicle Energy Efficiency Validation in Territory Surveillance Mission E. Våljaots, R. Sell and M. RIMASAUSKAS	164
Electro- and Magnetosensitive Adhesive Compositions E. Dragašius, A. Bubulis, A. Dostanko, Z. Novikava, V. Kuzmin and E. KOROBKO	171
Design and Numerical Analysis of a Roof-Mounted Bicycle Carrier M. Ptak, J. Karliński, D. DERLUKIEWICZ and P. DZIAŁAK	177
Analysis of Compact Bone Vibration Assisted Drilling R. Zakrasas, V. JURENAS and J. Baskutiene	183
Correction of Characteristics of Transverse Vibration Subsystems of Complex Mechanical or/and Mechatronic Systems A. Buchacz	188
Analysis of Crack Growth Path under Simple and Mixed-Mode Loading in Specimens with Rectangular Section S. Faszynka and D. Rozumek	194
Dynamic Simulation of Internal Support of Remote Controlled Weapon Station A. Iluk, T. LEWANDOWSKI, J. PTAK and C. BOROWIECKI	200
Geometrical Structure for Endoprosthesis Surface Lubrication and Wear Prognosis K. Wierzcholski	206
Braking Current Spectral Characteristics for Linear Induction Motor with Short Secondary Part B. Karaliunas, E. Matkevicius and B. MITKIENE	212
Fuzzy Controller for Aircraft Anti-Icing System - Initial Design and Analysis N. Grzesik and K. KOWALIK	218
Dynamics of Linkage Mechanism Solved by Means of Contour Graphs and Bond Graphs J. Drewniak, P. Garlicka, J. KOPEĆ and S. Zawiślak	224
Development of the Operation Algorithm for a Automated System Assessing the High-Rise Building I. KOROBICHUK, A. SHOSTACHUK, D. SHOSTACHUK, V. SHADURA, M. Nowicki and R. Szewczyk	230
Application of an Automatic Plant Irrigation System Based Arduino Microcontroller Using Solar Energy Ç. ERSIN, R. Gürbüz and A.K. YAKUT	237