

# Table of Contents

## Preface and Organizing Committee

## Chapter 1: Applied Mechanics

<b>A Subassembly Simulation Method with Physical Deformation and Reconstruction of an Aircraft</b> Y.G. Kang, F.Y. Guo, T. Xu, J. Huang and C. Ren	3
<b>Study on Influences of Air Spring Failures on Ride Quality of High-Speed Railway Trains</b> D. Gong, W.J. Sun and J.S. Zhou	9
<b>Study on the Resonant Frequency Gliding in the Ultrasonic Systems Loaded with Variable Axial Compression Force</b> A. Adam and D. Stan	16
<b>Application of Fuzzy Structural Analysis for Damage Prediction Considering Uncertain S/N Curve</b> M. Vaško and M. Sága	21
<b>Rough Air-Soft Elastohydrodynamic Lubrication</b> K. Wongseedakaew and J. Panichakorn	30
<b>Theoretical Investigation of Transient Lubrication in Spur Gear</b> J. Panichakorn and K. Wongseedakaew	36
<b>Variable Reynolds Number Experimental Study on Aerodynamic Characteristic of Supercritical Airfoil RAE2822</b> N. Wang and C. Gao	42
<b>Experimental Investigation on Cavitation Characteristics of a Three-Groove Journal Bearing</b> Y. Yang and J.H. Dai	47
<b>Performance Analyses of the Spiral Groove Dry Gas Seal with Inner Annular Groove</b> Y. Li, P.Y. Song and H.J. Xu	51
<b>Design of 3-D Functional Characteristic Parameters of Rolling Interface Measurement System</b> D. Xu, J. Zhang, H.B. Li, J.S. Lu, Q.G. Fan and H.L. Dong	56
<b>Crack Identification in Vibrating Beams Using Haar Wavelets and Neural Networks</b> L. Feklistova and H. Hein	62
<b>Sensitivity Analysis Application for Multibody System Synthesis</b> A. Sapietová, M. Sapieta and B. Hyben	68
<b>Experimental Research on Cavitation Characteristics of a Novel Hybrid Journal Bearing</b> Y. Yang, J.H. Dai and X. Li	74
<b>Optimizing of Electric Discharge Texturing Parameters of Rolls of the Rolling Mill of Steel Sheets</b> E. Evin, J. Kmec and E. Fečhová	78
<b>Influence Analysis of Geometric Errors to Volumetric Machining Accuracy of a 5-Axis CNC Machine Tool</b> L.G. Cai, Q.N. Feng, Q. Cheng, P.H. Gu and C. Zhang	85
<b>A Study on the Sound-Absorbing Characteristics of Multi Air Layer</b> K.H. Liu, R.P. Lai and C.H. Kuo	92
<b>Research on Ceramic Title Automatic Packaging Corner Machine Based on Extension Theory</b> A.H. Li, G.Q. Zhang and Y.L. Li	99

## Chapter 2: Materials Science and Materials Processing Technology

<b>Preparation and Properties of Poly(lactic Acid) Fiber Reinforced PHBV Composite</b> G.L. Liang, Z.H. Li, J.M. Wu, X. Zhao, W.J. Jiang, Z.H. Chen, J. Guan, S.J. Huang and X.Z. Zhang	107
--	-----

<b>Self-Assembly of Asymmetrical Diblock Copolymers Confined in Carbon Nanotube</b> Y.X. Zuo, G.Q. Wang, Y. Yu, C.C. Zuo and Y.R. Wang	114
<b>Influence of Various Nanofluid Types on Wavy Microchannels Heat Sink Cooling Performance</b> P. Gunnasegaran, N. Narindra and N.H. Shuaib	118
<b>The Microstructure and Tribological Behavior of Ti/a-C and Ti/a-C:H Films Prepared by Magnetron Sputtering</b> C.F. Hong, J.Z. Wang, W. Yan, A. Ding, Z.Y. Liu, G.P. Lin and J.P. Tu	123
<b>Ozonation Influence on Aluminum Ions in an Aqueous Solution, in Different Temperature Conditions</b> C.I. Neamtu, L.C. Bolundut and E.M. Pica	129
<b>Defects and Electrical Properties of Crystalline Silicon at Different Metallurgical Route</b> H.X. Lai, L.Q. Huang, M. Fang, C.H. Lu, J. Chen, D.Q. Yu, J.T. Li, W.H. Ma, J.N. Shen, Z.L. Sheng and X.T. Luo	134
<b>Effect of Na<sub>2</sub>O-SiO<sub>2</sub> Slag Treatment on Hydrometallurgical Purification of Metallurgical Grade Silicon</b> M. Fang, C.H. Lu, H.X. Lai, L.Q. Huang, J. Chen, J.T. Li, W.H. Ma, J.N. Shen, Z.L. Sheng and X.T. Luo	139
<b>A Study on the Characteristics of Bogie Frame Materials</b> S.C. Yoon, Y.S. Kim, J.H. Ryu, S.H. Park and G.S. Park	144
<b>The Influence of the Processing Parameters in the Ultrasonic Activated Injection and Extrusion</b> A. Adam and D. Stan	149
<b>Investigation on Fe-Sn-O Catalyst Activity for the Growth of Carbon Nanocoils</b> X. Fu, D.W. Li and L.J. Pan	154
<b>Study on Microstructure and Tensile Properties of New Cu-Al Bi-Metal Tubes Versus Pure Copper Tubes</b> A. Baghdadi, Z. Sajuri and J. Syarif	160
<b>Microstructure Characterization of Low Density EPS</b> D.D.L.P. Jose Angel, P.M. Hector, T.C. Miguel and M.S.M. de Lourdes	167
<b>On-Road Particulate Emission Characteristics of a Diesel Vehicle with Butanol-Diesel Blends</b> D.M. Lou, L. Fang, Z.Y. Hu and P.Q. Tan	177
<b>Determination of Specific Heat of Eutectic Indium – Bismuth-Tin Liquid Metal Alloys as a Test Material for Liquid Metal - Cooled Applications</b> A. Lipchitz, G. Harvel and T. Sunagawa	185
<b>Localization Luders Band in Infrared Spectrum</b> M. Sapieta, O. Stevka and V. Dekýš	194
<b>MFS Heat Conduction Modeling of Composite Materials Reinforced by CNT-Fibers with Large Aspect Ratio</b> M. Žmindák, Z. Pelagić and M. Dudinsky	202
<b>Advantages of Bioplastics and Global Sustainability</b> Y.J. Chen	209
<b>Effect of a New Organic Inhibitor for Carbon Steel in Salt Solution</b> K.F. Al-Sultani, F.A. Al-Seroury and S.A. Abdulsada	215
<b>Synthesis, Characterization and Mechanism of Benzamide Intercalated Kaolinite by Replacement Method</b> H. Xia and S.H. Zhang	222
<b>The Effect of Nanoparticles Modification on PLA/Nano-ZnO Composite</b> L.B. Ding, J. Rui and J.T. Li	230
<b>Research on the Friction and Wear Properties of the NBR under Dry Sliding and Water Lubrication</b> F.Y. Yang, S.J. Wang and X.R. Lv	234
<b>Dehydrogenation Pressure Drop in NaBH<sub>4</sub> Solution in Ru-Catalyzed 300 μm Microchannel Chemical Reactor</b> H.J. Lee	240
<b>Analysis of the Cutting Zone Machinability during the Drilling of Cast Iron GTW 35-04</b> J. Jurko, A. Berdis, J. Gecák and J. Nemcová	246

<b>Manufacturing Accuracy when Drilling Holes in Stainless Austenitic Steels DIN 1.4301</b> J. Jurko	250
<b>Research on the Whitening Mechanism of Kaolin by Chemical Bleaching and Calcining</b> C.H. Lu, M. Fang, H.X. Lai, L.Q. Huang, J. Chen, C.L. Fu, J.T. Li and X.T. Luo	254
<b>A Comment on Fay's Formulae about the Spread of Oil Slick on Water Surface</b> Z.C. Wu	259
<b>Compatibility between Paclitaxel and Polymer Carrier</b> W. Zhao, W.L. Liu and J.L. Wang	263
<b>Micro-Mechanical Analysis of Composites Reinforced with Discontinuous Fibers with Large Aspect Ratio</b> M. Žmindák, M. Dudinsky and Z. Pelagić	269
<b>Development of Sediment Brick Utilizing Reservoir Sediment and Fly Ash</b> B.S. Mohammed, E.L. Woen, M.A. Malek, W.L. Sing, N.A. Abbas, H. Yusop, R.S. Muda, M. Hashim and U. Yong	276
<b>On the Determination of the Initial Composition of the Interior Finishing of the Voskresenskii Temple of the Znamensky Male Monastery in Kursk (Russian Federation)</b> A. Krygina, V. Kretova and A. Savenkova	281

### **Chapter 3: Information Technologies and Computational Procedures in Engineering Researches and Design**

<b>Application Case Study Based on Service Component Oriented Architecture</b> J.F. Tang and Z.Y. Fang	291
<b>Application Research of IP Direct Connection to Access Mainframe Using CICS Web Support</b> J.F. Tang and X.N. Zhang	298
<b>Some Features of Radio-Spectral Diagnostics of Random Media via PM and PRM Oscillations</b> N. Gomidze, M. Khajishvili, K. Makharadze and I. Jabnidze	305
<b>An Improved Artificial Immune System Model</b> G.Y. Li and T. Guo	311
<b>Contribution to Multiaxial Damage Calculation Using FEM</b> P. Kopas, S. Milan and M. Uhrčík	318
<b>A Framework for Object-Oriented Data Mining Based on Higher-Order Logic Programming</b> Z.P. Zhang, L.N. Li, L.J. Wang and H.Y. Yu	325
<b>Design and Implementation of the 3-D Simulation Model for TPS Power Supply Cable Engineering</b> C.Y. Liu, D.G. Huang and K.B. Liu	333
<b>DNA Sequence Design Based on the Same Subsequences</b> H. Li and F.F. Ma	339
<b>The Length Design of the Same Largest Subsequence</b> F.F. Ma and H. Li	343
<b>Bi-Directional Evolutionary Structural Optimization Method with Draw Direction Constraints</b> T.T. Chung, J.P. Wang, Y.Z. Chen and T.C. Liu	346

### **Chapter 4: Control and Automation Systems**

<b>Research on Modeling and Control Strategy of Parallel Hybrid Electric Back-Loading Compression Sanitation Vehicle</b> R. Yang, D.M. Lou, P.Q. Tan and Z.Y. Hu	355
<b>Analysis on Model Nonlinearity for Control System of Heat Supply Unit</b> X.P. Liu, L. Tian, Q. Wang and H. Li	363
<b>Model of an Rotating Valve Based Electro-Hydraulic Servomechanism and its Dead-Zone Compensation Control</b> Y.S. Wang, H. Li and L. Tian	369

<b>A New PID Control Method for Hydraulic Turbine Governor</b> Y.S. Wang and H.L. Zheng	375
<b>Study on an Improved Generalized Predictive Control Algorithm in 660MW Generating Unit</b> T.X. He and Y. Du	381
<b>Position Control of a Flexible Beam Actuated by Two Active SMA Wires</b> M.R. Zakerzadeh	387
<b>Research on Temperature Control System of Fruit and Vegetable Processing Line Based on Fuzzy Immune PID</b> Y.L. He, Y. Liu, X.G. Wei, Q.F. Zhang, J.P. Li and X.P. Zhang	395
<b>Study on Testing System for Real-Time of Communication of the Digital Substation's Secondary Equipments</b> Z.S. Wang, X. Zhao, J.J. Gao, P. Yang, W. Xu and H.X. Pan	401
<b>Analysis on the Combination of Machinery Manufacturing Theories and Automated Manufacturing Modes</b> C.R. Zhao	407