

Table of Contents

Preface and Organizing Committee

Chapter 1: Applied Mechanics, Research and Design of Mechanisms and Machines

Dynamics Modeling and Analysis of Multi-Point Ejection Mode of Space Nets System Q.Y. Gao, Q.G. Tang, Q.B. Zhang and Z.W. Feng	3
Vibration Characteristics Analysis of an Elastic Cavity M. Kang and J. Lu	9
Simulations and Stability Analysis of Wave-Induced Motions of a Freely Floating Body Using ADINA T. Yao and Z.Y. Chang	14
The Single-Abrasive Coupled Flutter Model in Power Ultrasonic Honing X.Q. Zhang, X.J. Zhu, H.Z. Geng, J.Q. Wang, Q. Cheng and L.L. Cheng	19
Theoretical Analyses of Vibration and Sound Radiation Responses of Heated Symmetric Laminated Plates in Pre- and Post-Buckling Ranges W. Li, Q. Geng and Y.M. Li	23
Changes in Gait Characteristics due to Outsole Structure of Shoe J.S. Choi, D.W. Kang, J.W. Seo, J.Y. Kim, S.T. Yang, D.H. Kim and G.R. Tack	28
Analysis of Vertical Rolling Force with GM Yield Criterion and Anti-Symmetric Parabola Dog-Bone Shapes H.Y. Wang, D.W. Zhao and D.H. Zhang	34
Development for a Hot-Water Heating System Using Biogas Energy in the Pig Farm C.C. Lien, J.L. Lin and P.K. Lei	39
Study on Energy Saving of the Air-Conditioning Exhaust Heat Recovery System in Office Buildings Y. Zou	44
Parametric Study of Heat Insulation in Case of Plate Heat Exchangers M. Kubín and J. Hirš	50
The Study of PTFE Wicks Application to Loop Heat Pipes with Flat Evaporator S.C. Wu, S.S. Yan, C.Y. Chung and S.J. Su	54
The Rapid Engineering Aero-Heating Calculation Method for Hypersonic Vehicles L. Huo and T. Yang	59
Design and Implementation of the Clamping Device for the Underwater Blast Shoveling H. Zhang	68
Non-Newtonian Inertia Squeeze Film Characteristics in Rectangular Stepped Plates J.R. Lin and S.T. Hu	73
Design and Development of New Type Conductor Delivery of Air-Suction Metering Device S.G. Wang, J.M. Kang and L.M. Yan	78
Effects of Mission Requirements on Primary Parameters of Wing-Sail Solar-Powered Aircraft J.L. Xuan and B.F. Song	83
Thermal Resistance of Perforated Heat Sinks with Circular Pin Fins Cooled by Natural Convection M.Y. Wen and C.H. Yeh	88
3D Unsteady Heat Transfer in Multi-Connected Domains via LSFEM: A Case Study E.C. Romão	93
Development of an Adaptive KIT for Wheelchair Turning it into an Electric Tricycle R.B. Cunha, G. Goulart Mendes Marra, P.P. Brito and C.B. Santos Vimieiro	98
Neuro Model Approach for a Quarter Car Passive Suspension Systems D. Hanafi, M.F. Zakaria, R. Omar, M.N.M. Than, M.F. Rahmat and R. Ghazali	103

Study on LNG Carrier Safety and Explosive Boiling Effects on the Process of LNG Releasing on Water	
B. Zhang, G.F. Yu, X. Feng, L. He and J.W. Zhang	110
Correlations between Gun-Barrels Temperature Rising and Shooting Specifications	
Y.H. Shan, Z.G. Nie, S.Q. Shan and L.D. Tan	115
Feasibility of Internally Reinforced Thin-Walled Beams for Industrial Applications	
H.M. Silva and J.F. Meireles	119
Numerical Simulation Analysis of Ink Temperature Field in the Printing Process	
W. Huang, H.Y. Chu and L.G. Cai	125

Chapter 2: Materials Science and Technology for Materials Processing

Interaction among n Parallel Dislocations in One-Dimensional Hexagonal Quasicrystals	
G.T. Liu and L.Y. Yang	133
Laser Beam Welding of Borated Stainless Steel	
D. Drimal and F. Kolenic	138
Rapid Synthesis and Characterization of CuInS₂ Prepared Using Microwave-Assisted Heating	
M.K. Tsai, Y.C. Lee, C.C. Huang, S.Y. Hu, K.K. Tiong and B.J. Chen	143
Performance Evaluation of Rice Bran and Moringa Blended Biodiesel in CI Engine	
M.A. Wakil, M.A. Kalam, H.H. Masjuki, H. Sajjad, M.M. Rashed and H.K. Rashedul	147
Effect of Aging and Annealing Treatments on the Microstructural Behavior of Some Al-Si Based Alloys	
Z. Sersour and L. Amirouche	152
Study on Properties of Polylactic Acid and Modified Calcium Carbonate Composite Materials	
S.Q. Jiang	160
On the Question of the Choice of Reducing Agent Tungsten at Electroslag Remelting Flux Containing Scheelite Concentrate to Produce Tungsten Steel	
E.N. Kuzmichev, A. Verkhoturov and D.S. Shtarev	165
New Insights on the Morphology of Nanocomposite Prepared by <i>In Situ</i> Emulsion Polymerization	
J.C.d.M. Neto, J.E. Neto, N.R. do Nascimento, S. Contant and L.M.F. Lona	170
High-Temperature Oxidation of Ti₃Al_{0.7}Si_{0.3}C₂ Carbide at 1100 and 1200°C in Air	
D.B. Lee	176
Effect of Zero Valent Iron (ZVI) in Wastewater Treatment: A Review	
N. Boontian	180
Solubility and Thermodynamic Properties of L-Proline in Methanol-Dichloromethane Mixtures	
Z.D. Chen, K.K. Wang, X. Li, S. Wang, S. Wu, M. Li and E.H. Duan	185
First-Principles Study of Structural and Vibrational Properties of α-SiO₂ under Pressure	
X.W. Lei, Y. Song, K. Yang and H. Zhao	191
Residual Stress Measurement in Inorganic Phosphate Adhesive Joint by Raman Spectroscopy	
C.K. Ma, J.F. Zhang, H. Qi and L.M. Zhou	197
Experimental Study on the Mechanical Properties of Shape Memory Alloy	
C. Xu and Q.R. Zhu	204
Indirect Selective Laser Sintering of 316L Powder and the Properties of the Parts	
N.F. Ren, Y.H. Hang, Y. Zhao and Q.Y. Yang	209
The Surface Quality Detection and Electrical Discharge Mirror Machining with Non-Mixed-Powder	
Y. Lin, H. Jiang, H.R. Lv and X.W. Sui	214
Numerical Simulation for the Multi-Point Incremental Forming Process	
W.M. Yang, Y.X. Luo, Z.F. Liu and R.X. Du	219
Development of a Simulation Model of Cutting Slabs in a Continuous Casting Machine	
K. Aksyonov and A. Antonova	224
Research on Optimum Processing Parameter of EDM Based on Support Vector Machine	
H. Jiang, Y. Lin, S. Wang and X.W. Sui	229

Chapter 3: Building Materials and Construction

The Field Monitoring and Finite Element Analysis of Axial Force of a Deep Foundation Pit's Reinforced Concrete Inner-Supporting	
C. Cao, B. Yuan, S.T. Huang, J.L. Zhang and Q.M. Feng	237
Comparative Analysis of Three Kinds of Mega Steel Frame System Static Performance	
S.Q. Yang, J.H. Cai, J. Chen and B.J. Tang	243
Dynamic Responses of an X-Braced Jack-Up Leg with Pile-Soil Foundation	
S.H. Heo, W.C. Koo, M.S. Park and S.J. Kim	247
Uneven Settlement Effect of LNG Facilities Integrally Installed at Marine Construction Site	
J.C. Shi, X. Meng, Y.H. Zheng, Y.J. Liu, H.Y. Tian, S.J. Zhao and H.J. Ren	252
Analysis of Performance Test Result of a Rectangular Tuned Liquid Damper by Direction of Wind	
K.P. You, Y.M. Kim, J.Y. You and S.Y. Paek	259
Laboratory Experiment Study on Real-Time Monitoring and Safety Early Warning System of Structure Settlement and Deformation	
X.D. Pan and L. Zhao	264
Parallel Cellular Automaton Algorithm for Failure Processes of Brittle Rocks	
M. Cao and Z. Zhou	268
Damage State Identification and Seismic Fragility Evaluation of the Underground Tunnels	
T.S. Le, J.W. Huh, J.H. Ahn and A. Haldar	274
Current Status and Problems of Building Interior Decoration Using Low Formaldehyde-Emitting Materials in Taiwan	
L.L. Huang and H.C. Juan	279
Material Damping of Crushed Rock in Free-Decay Mode	
K. Senetakis and A. Anastasiadis	283
Research on the Compatibility of Cement-Based Biomass Materials Modified by Early-Strength Agents	
H. Qi, W. Qi and G.D. Sheng	287
Elastic Stiffness of Volcanic Sand through Resonant Column Tests	
K. Senetakis and A. Anastasiadis	292

Chapter 4: Mechatronics, Control and Automation

The Steady-State Response Analysis of Bistable Piezoelectric Converter	
M.H. Yao, Y.B. Li and W. Zhang	301
Fuzzy Control for the Obstacle Avoidance of a Quadrotor UAV	
Z.M. Wen, S.D. Zhou and M. Wang	307
Effect of Correcting the Electro-Hydraulic Servo Drive on the Stability and Controllability of an Airplane	
L.A. Igumnov and V.S. Metrikin	314
Study on Iterative Learning Control of Mobile Robot	
L.P. Qu, Y.Y. Qu and H.H. Zhou	319
Analytical Study of Piezoelectric Effect on Curvature and Mechanical Sensitivity in Large Deflection of Pre-Stressed Layered Plate Including a Piezoelectric Layer	
C.F. Chen and J.H. Chen	324
Catastrophic Results for Equipment and Machine Driving Systems when High Impact during Operation Occurs	
J. Aparecido Martins, P.C.P.M. Pardal and E.C. Romão	329
Optimal Control Strategy at the Main Reduction Process for Lunar Spacecraft Soft Landing	
X.Y. Zhang	334
New Results on PID Stabilization of Integral Process with Time Delay	
Y. Dong	339

Multi-Objective Optimization of Nonlinear Controller for Untripped Rollover Prevention of an 8-dof Vehicle Dynamic Model	
J. Rezapour, B. Bahrami Joo, A. Jamali and N. Nariman-Zadeh	347
A Gear Micropump without Bearings Production	
L. Rodionov, P. Rekadze and J. Stryczek	352
Design and Research of a Novel Fast Connecting and Separating Modular Space Manipulator	
S.J. Wang, B. Zhang, X. Wang and X.Q. Wang	357
Experimental Study on Nonlinear Vibration of Bistable Piezoelectric Cantilever Beam	
Y.B. Li, M.H. Yao and W. Zhang	363
Induced Lightning Stroke Identification on Protection Relays	
J. Morales and M. Carpio	368
Overvoltage Analysis Considering Transmission Tower Models Based on Impedances and Inductances	
J. Morales, J. Montesdeoca and G. Guidi	373
Analysis and Simulation of a High Step-Up DC-DC Converter for Renewable Energy System Applications	
S. Khwan-On and S. Vatcharasukpo	378

Chapter 5: Measurements, Instrumentation, Technologies of Detection and Monitoring, Computational Algorithms of Data Processing

The Testing System of Precise Motion Transmission Chains Based on Virtual Instrument	
J.P. Ma, W. Chen and J. Zhong	385
Design and Performance Test of a Novel Type of Gas Path Brake Control System Testing Instrument	
X.Y. Su, H. Guo, X.B. Qu and Z.L. Zhou	390
Development of Shaking Table for Rapid Detection System of Microorganisms	
H.D. Wang, Y.H. Sun and J.C. Chen	394
Bayesian Change Detection in the Growing Window Recursive Strategy	
J. Dokoupil and P. Václavek	399
Study Based on MATLAB Edge Detection Operator in Extracting Out-of-Gauge Goods Contour	
M. Qiao, M. Han and C. Chen	404
A Harmonic Source Location Method Based on PMU Measurements in Distribution Network	
B.J. Li, S.Q. Zhou and X.X. Lun	409
A Preliminary Study of DXA and QCT Derived Femur Cross-Section Stiffness	
Y.H. Luo, H.J. Yang, L. Targownik, A. Goertzen and W.D. Leslie	415
Online Dynamic Compensation of Pressure Sensor	
J.X. Zhang, K.S. Ge, Z.B. Gao and S.P. Dong	420
A Numerical Method for Calculating Fractional Derivative	
J. Huang, Y.J. Li and F. Huang	426
Algorithms for Maximum Leaf Spanning Tress of Edge-Growing Network Models in Information System	
X.M. Wang, X.Y. Zhao, B. Yao, M. Yao and X.E. Chen	431
Smartphone Based Classification System for Indoor Navigation	
Y. Aljeroudi, A. Legowo and E. Sulaeman	436
Development of Methods and Algorithms to Identify Real-Time Features of the Time-Frequency Characteristics of Electromagnetic Radiation in the Digital Data Radio Receiver	
A. Kalyaev, I.S. Korovin, M. Khisamutdinov and I. Kalyaev	441

Chapter 6: Organization of Production, Production Planning and Scheduling in Manufacturing and Industry

An Optimal Algorithm for Scheduling with Variable Job Processing Times and Rejection	
J.B. Wang and C.J. Hsu	449

Development of a Process Analysis System Oriented to Discrete Manufacturing Industry J.K. Sun, F.P. Yin and C.Y. Yang	453
Application of Ontology in Event-Driven Job-Shop Scheduling Problems X.M. Xu and X.F. Yao	458
Applying Process Capability Analysis in Paint Industry C.H. Hsu, C.M. Yang, C.Y. Chen and E.W.L. Ding	464
Influencing Factors of Manufacturing Upgrade in Zhejiang Province Based on Global Value Chain S.Y. Fu and S.X. Liu	468
Development of a Knowledge Management System for the Automobile Industry Based on CAPP J.K. Sun, H.H. Qiu and C.Y. Yang	474
Research and Implementation on Patent Knowledge Modeling Based on TRIZ C.Q. Gao, W. Chen, S.M. Mi and F. Zhao	479
Ontology-Based Assembly Design Representation for Model Reuse Y.F. Liang, Y.R. Zhong, M.F. Huang and C.W. Zeng	484
The Study of AERMOD and ISCST3 for Area Source Simulation in Taiwan W.J. Tseng, C.H. Tseng and H.C. Liu	491