

Table of Contents

Preface and Committees

Chapter 1: Materials Science and Technology

Numerical Simulation of High Speed Single-Grain Cutting Using a Coupled FE-SPH Approach R.D. Shen, X.M. Wang and C.H. Yang	3
A New Method of Parallel Projective Galvanometer Scanning for Laser Material Processing on Freeform Surfaces Y. Cao, T.T. Yu, X.L. Hu and F.P. Li	9
Application of Normal Forms to a Laminated Composite Piezoelectric Rectangular Plate with One-to-Three Internal Resonance S.P. Chen	14
Research on the Technology for DC CMT Welding of AZ31B Magnesium Alloy R.Y. Zhang, Y.Y. Hu and J. Wang	18
A Three-Dimensional Numerical Analysis on the Effective Permittivity of Composites Including Ellipsoids D.Y. Zhang, L.M. Yuan, Y.G. Xu and J. Cai	23
Effect of the Process Parameters of Laser Cladding on Microstructure of Ni-Based Titanium Carbide C.L. He, G. Zhang, Y.P. Wang, L. Zheng, X.S. Chen, S.K. Chen, Z.H. Zhou and W. Feng	28
Research on the Activity of Calcium Oxides under Various Calcination Temperatures Y.L. Wang, S.P. Cui, Y. Yao and M.M. Hou	34
Catalytic Synthesis of Benzyl Acetate by Diatomite Supported Waugh-Type $(\text{NH}_4)_6[\text{MnMo}_9\text{O}_{32}] \cdot 8\text{H}_2\text{O}$ S.H. Liu	38
The New Technology of Preparation Activated Carbon from Lignite Y. Yuan, Z. Chen, H.L. Qin and Z.W. Han	42
Inductively Coupled Plasma Modified Silica Material Technology Research L. Li, Y.Q. Jia, J.L. Zhao and Y.Y. Gao	47
A Simple and Practicable PCR-Microchip with Bubble-Free Stationary Chamber J. Luo, W.P. Zhang, W. Liu, F. Cui, W.Y. Chen, X.S. Wu and J.T. Cao	51
Synthesis and Evaluation of Enteric Aqueous Polymethacrylate Coating Material X.Q. Chen, C. Liu, H.J. Zhou, X.L. Zhang, F. Wang and Y.T. Li	56
The New Technology of Precision Grinding High Performance Ceramic Materials F.H. Kang	61
Synthesis of $\text{CuIn}_{0.7}\text{Ga}_{0.3}\text{Se}_2$ Nanoparticles and its Quarternary Sputtering Target J. Zhou, F.Q. Zhang and L.H. Xia	65
DWT-SVM on Near-Infrared Spectra for Moisture and Volatile Determination of Coal X.L. Yang, F. Wang, J.S. Chen and S.H. Zhang	71
Investigation on Work Hardening Effect Generated during Dynamic Formation of Al-Based Coating on Magnesium Alloy X.M. Wang, S. Zhu, X.Q. Feng and Y.X. Liu	75
Synthesis of d4T- 5'-glycosyl-1''-phosphoramidates from <i>H</i>-Phosphonates via an Oxidative Coupling Strategy S.S. Gong, G.D. Liu, Q.K. Yang and Q. Sun	79
A Brief Review of Cardanol-Based Surfactants X.H. Yang, Z.M. Wang, F. Jing, L.H. Hu and Y.H. Zhou	83
A Novel <i>H</i>-Phosphonate Method for the Synthesis of D-Mannose-1-Phosphate X.J. Li, S.S. Gong and Q. Sun	88
Efficient Synthesis of <i>O</i>-glycosyl-5'-<i>H</i>-Phosphonate Diesters of d4T G.D. Liu, S.S. Gong, S. Liu and Q. Sun	92

Synthesis of 4-Hydroxyl Pyrazolo[3,4-<i>d</i>]pyrimidines from the Corresponding 4-Chloride Precursors with Acetic Acid J. Sun, S.S. Gong and Q. Sun	96
Preparation of Magnetic Nanoparticles from Byproduct of Titanium Dioxide-Copperas S.J. Bai, S.M. Wen and C. Lv	100
Research on and Applications of Au/Pt Thermocouples G.C. Zhao, C.L. Zhao, L.P. Song and X.Y. Tong	105
Effect of Near β Heat Treatment Process on Microstructure of TC18 Alloy H. Quan, K.H. Qiu, D.M. Huang, J.Y. Liu and R. Chen	110
Effects of the Preparation Parameters on the Properties of Graphite/Carbon Fiber/Copper/Phenolic Resin Composites M.D. Li, H. Niu and H. Yang	115
Extraction Study of Nitro Humic Acid from Lignite by Dry and Wet Process Y. Yuan, J.P. Liu, Z. Chen and H.C. Li	119
Pseudopotential Calculation for the Electronic Properties of TbFeO₃ with Perovskite Structure J. Li	124
Giant Electroresistance Induced by Electric Currents in Epitaxial Thin Films of Pr_{0.7}Sr_{0.3}MnO₃ H.Y. Liu, L. Zhou, Y. Li and G.D. Liu	130
Study on Mesoporous PW/SBA-15 for Isomerization of α-Pinene C.H. Wu, H.Q. Liu, C.F. Zhuang and G.B. Du	134
Effect of Particle Size of BNT Filler on Dielectric and Mechanical Properties of LCP Based Composite M.P. Chun	138
Research on the Rationality of the Combined Application of Bamboo and Wood in Outdoor Furniture J.S. Gao and Z.F. Zhang	142

Chapter 2: Mechanics, Energy, Thermal and Dynamic Systems

A 3-Dimensional Numerical Analysis of Solar-Panel-Chimney for House Ventilation S.H. Wang, C. Sheng, H.M. Chou and S.C. Yu	149
Numerical Simulation on the Effect of Mist on Impingement Cooling of Double Chamber Model G.J. Liu, T. Xu, H.C. Ge, Z.L. Yu and T. Yoshino	154
Simulation and Experimental Study of Oscillator for Permanent Magnet Vibration-to-Electrical Power Generator Z.H. Wang, M. Zhang, N. Li and L. Wang	158
Numerical Simulation of Liquefied Natural Gas in Rib-Tube S.H. De, Z.Y. Fu, J.Y. Che and X.L. Wen	162
Research on the V/H Inspection of Spiral Bevel Gear before Heat Treatment J.L. Qiu, R.R. Zhao, Y.J. Wang, W. Zhao and J.C. Li	166
Energy Spectra of the Low-Lying State in N-Layer Quantum Dots A.M. Wang	170
Study on an Intelligent Teaching Dynamic Balance Technology S.P. Cai and T. Zhao	174
A Surface Roughness Model in Radial-Mode Abrasive Waterjet Turning for High-Tensile Steels W.Y. Li, H.T. Zhu, J. Wang and C.Z. Huang	177
Dynamic Characteristics Analysis of Spiral Bevel Gearbox Used in Ship Lift Synchronization System T.J. Lin, Z.Y. He, F.Y. Geng and H.J. Que	182
The Effects of Stack Parameters on the Performances of Acoustic-Refrigeration Thermoacoustic Conversion System X.H. Li, C. Li and Y.X. Cai	186
Study on the Equivalent Thermal Conductivity of Superalloy Honeycomb Core Structures Z.H. Xie, J.F. Sun, W. Li, J. Zhao and X.S. Yue	194

Parametric FEM Analysis of Disc Brake D.F. Chen, L. Ma, X.X. Guo and Q. Zhang	199
Thermal Stress and Modal Analysis of Engine Exhaust Manifold C. Chen, L. Ma and Z.W. Tian	203
Energy Consumption Modelling for Air-Cushion Vehicles S. Xu, J. Sun and J.X. Shen	208
Research on Energy Efficiency Evaluation Algorithm Based on Database System H.J. Zhu, H.F. Gao, C.B. Wei and Z.Y. Wang	214
Numerical Simulation and Comparison on the Inner-Flow Field in Hydraulic Feedback Pump S.Q. Xiao, D.Y. Zhu and S.Q. Liu	219
Analysis of Hydrodynamic Model of Wave Energy Converter of Inverse Pendulum S.Q. Cao, S.M. Fu and Z.Y. Wu	223
The Modeling and Locating Technology of Assembly\Disassembly Tools in Virtual Environment Y. Liu, S.Q. Li and J.F. Wang	229
Simulation of Aerosol Sampling Inlet for Different Outlet Angle B.Q. Wang, Z.B. Wang, Y.Y. Li, R.H. Chen and S. Yao	234
Numerical Simulation of the Effect of Spoiler Ribs on the Flow Field in Household Soymilk Maker L.H. Zhu, Q. Song, G.P. Li and X.B. Ze	238
Precise Ultrasonic Motor Driver Design and Analysis J.H. Wang, M.F. Chen, G. Han and B.M. Hou	243
Calculation of Thermal Analysis Kinetics Using Least Mean Square Method X.P. Liu, Y. Cui, Y.W. Yao, G. Chen and Z.S. Liu	247
The Modified Iteration Method for Wet Cooling Towers to Calculate the Cooled Water Outlet Temperature W. Wang, D.L. Zeng and Y. Hu	253
Environmental Analysis on Insulation Resistance Reduction Case L. Qiao and J.F. Sheng	257
Selecting L and C of the Passive Dynamic Harmonic Filter Y.L. Liang, J. Chen, K. Yang and Y.X. Yuan	262
The Mechanical Model of the Dynamic Characteristics of the Bituminous Concrete Compaction Mechanism L.L. Zhu	266
Noise Analysis of Disc Brake for Automobile D.P. Wang, J.S. Cao and W.Z. Liu	271
Research on Power Flow Interface Oriented Regional Wind Power Forecasting Method Y. Yu, B. Yang and F.J. Ge	275
Influence Parameters Analysis of Forming Quality and System Dynamics Simulation of Vertical Steel Bar Bending X.J. Zheng, X.Z. Wang, J.M. Zhang and Y.F. Zhu	280
Stability Analysis of Nonlinear Stiffness Rotor-Bearing System with Pedestal Looseness Fault Y.G. Luo, S.H. Zhang, B. Wu and H.Y. Hu	285
Effect of Bolt Slippage and Joint Eccentricity on the Response of Lattice Structure with Non-Uniform Settlement H.W. Zhang, P. Wang and H.B. Chen	289
The Finite Element Analysis Concerning the Slip Coat of Workover Rig J.Q. Jin, Y. Yuan and X.R. Wang	297
Lightweight Design of Tanker of LPG Truck Based on Material Strength Equivalent Substitution B. Zhou, L. Ma, Z. Wang and Z.Z. Zhang	301
Study on the Mechanical Properties and Seismic Performance of Beam-Column Joints of Wooden Structure Building L.W. Luan and Z. Tao	305
Stress Analysis of Asymmetric Spur Face-Gear Pair Based on Finite Element Method N. Zhao, M.Q. Zhang and H. Guo	309

Boosting the Efficiency of an 800 MW-Class Power Plant through Utilization of Low Temperature Heat of Flue Gases	
M. Wołowicz, J. Milewski, K. Futyma and W. Bujalski	315
Identifying the Unit Area Dynamic Characteristic Parameters of Fixed Joint Based on Equivalent Single DOF System	
Y.C. Xiao, L.S. Wu, J.F. Ma and H. Hong	322
Correlation between BMD & Radio Density of Human Bones for Strength Evaluation	
S.N. Khan, R.M. Warkhedkar and A. Shyam	326
Effect of Height and Width of Road Humps on Deceleration Performance and Driving Safety	
S. Lan, F. Gao, G.Y. Xu and N.G. Ding	330
Stability and Oscillation Phenomena Analysis in Microbial Continuous Fermentation Time-Delay System	
Y. Wang, X.H. Li and X.M. Li	337
Research of Vibratory Feeder Activated by the Bimorph Vibrator	
J. Su, Y.H. Shen and Z.G. Yang	342
Mechanical Efficiency Analysis of Animal Locomotion by Specific Resistance	
S.H. Park and D.P. Hong	347

Chapter 3: Detection and Monitoring Systems

Successive Loop Closure Based Controller Design for an Autonomous Quadrotor Vehicle	
A.M. Singh, D.J. Lee, D.P. Hong and K.T. Chong	361
Multi-Channel Detection System for Joint Position Based on Optical and Orthogonal Decoding	
Q.X. Hu	368
The Design and Implementation of Data Sampling and Processing System of EUV Camera Based on FPGA	
L. Huang, X.Z. Li, Q.L. Zhao and C.S. Han	374
An Air Wipe Based Grease Removing and Saving Device for Anti-Twist Rope	
X.J. Wu, W.H. Cui, H. Wang, J.S. Lin and L. Tang	378
The Decontaminating Device in Steel Wire Rope Automatic Cleaning, Detection and Maintenance Integration System	
J.J. Chen, H. Wang, J.S. Lin, C. Fu and L. Tang	382
Indentation Tests Based on Gelatin Phantom	
L. Song, T. Su, L.Y. Gao and Q.H. Zhang	386
The Research and Application on Light Shape Detection of Car's Headlamp	
X.D. Liu, S.G. Dai and P.A. Mu	391
Oil-Gas-Water Three-Phase Flow Monitoring Based on Image Fusion of ECT and ERT	
L.F. Zhang	397
Research on Signal Acquisition Based on Wireless Sensor for Foot Compressive Characteristics on Basketball Movement	
J.H. Wang and Q. Ji	401
The Application of ICA-SVM Method for Identifying Multiple Faults in Asynchronous Motors	
H.Q. Zhu, R.M. Fang and C.Q. Peng	405
Optimal Control for Vibration of Restrained Cantilever Fluid-Conveying Pipe	
R.D. Bao and J.F. Dong	409
Study on the Comparison of Two Metrics Used in the Fields of Object Tracking	
Y.H. Xie and C.D. Wu	419

Chapter 4: Engineering Design, Optimization and Management

The Design Simulation and Parameter Matching Optimization of Electric Drive System for Heavy Off-Road Vehicle	
X.J. Ren and L. Ma	425

Economic Analysis of Large-Scale Biogas Project Based on System Dynamics L.L. Wang, L.J. Zhao, L. Ma, G.L. Yang and W.Z. Li	429
Design Optimization for the Robustness of Dimensional Tolerance by Using Evidence Theory H.X. Guo	434
A Method of Optimal Module Partition in Green Product Configuration Design under Uncertainty D.T. Liu and H.P. Hu	438
Optimization Calibration of Engine Ignition Advance Angle Based on Engine Model S.K. Zhang, R.Y. Sun, H.M. Yan and K.R. Wang	446
Multivariant Optimization Algorithm for Multimodal Optimization B.L. Li, X.L. Shi, C.X. Gou, T.S. Li, Y.J. Liu, L.J. Liu and Q.H. Zhang	453
Multivariant Optimization Algorithm with Absorption for Multimodal Optimization C.X. Gou, X.L. Shi, B.L. Li, T.S. Li, Y.J. Liu, L.J. Liu, Q.H. Zhang and J.J. Li	458
Design of Onboard Device to Diagnose Track Fault Online L. Qin, D. Wei and Y.B. Sun	465
Analysis on Game Behavior of Local Governments in Reverse Logistics of ELV C.X. Bao and X.Z. Mu	471
Remaining Life Prediction Based on HOLT Algorithm for Civil Aero-Engine F. Bai	479
Topology Optimization of Thin-Shell Frame with Surface Loads Y.G. Ke, L. Ma and Y.Y. Du	484
Flow Field Analysis and Optimization Design of Fan Cover for the Duct System of the Split Air Conditioner's Outdoor Unit J. Ma, W. Yang, L. Gao and H.L. Wang	489
Research on the Design and Extraction of Vehicle Brand Form Gene X.L. Chen and X. Li	497
Survey of User Needs for Design Knowledge Management for Product Life Cycle D.M. Zhang, Y.Q. Song and Y.C. Xu	502
Knowledge Tracing Modeling for Product Design Knowledge Management D.M. Zhang, Z.C. Yin and Y.C. Xu	506
Topology Optimization for Eigenvalue Problems in Aerospace Structure Design with Rigid Links J.H. Zhu, H.H. Gao and J. Hou	510
The Affection of Fasteners Load Constraint in Topology Optimization J.H. Zhu, J. Hou and H.H. Gao	514
Use of Logistic Approach in Optimizing the Rotary Kiln Run J. Lisuch and J. Gonos	518
Optimization of Distributed Systems' Fusion Based on Climb-Ant Algorithm X.H. Hu, H.J. Wang, D.R. Ren and C. Gong	524
Design of PSO Based PI Controller for Wind Turbine Systems J.W. Perng, G.Y. Chen, D.M. Tsay, J.H. Kuang, B.J. Lin and G.S. Hwang	529
Failure Probability Calculation of Tower Crane Hoisting Mechanism X.J. Zheng, Y.Y. Wang and Z.Y. Xie	533
Research on the Assembly Line Scheduling of Fixed Objects for the Large Complex Products Y.L. Lin and J.F. Lu	538
A Method of the Green Product Configuration Design Based on Multi-Layer Generalized Operator and Genetic Algorithm D.T. Liu and F.F. Jia	542
Multi-Objective Dynamic Optimum Design of Crane Gearbox T.J. Lin, F.Y. Geng, Z.Y. He and G.M. Lan	550
The Design of Photoelectric Measuring System on Railway Track Parameters G.W. Chen	555
Design of a High Force Voice Coil Motor D.H. Ahn, D.P. Hong and D.G. Gweon	559

Design Optimization of BAW Micro-Piezoelectric Disk Gyroscope through Finite Element Method	
Z.X. Xu, W.P. Zhang, Y.X. Cheng, G. Zhang, J. Tang, Y.H. Wang and W.Y. Chen	563

Chapter 5: Information Technology and Algorithms

Power Flow Calculation of Distribution Network with DG Based on Advanced Forward and Backward Substitution Algorithm	
L.Y. Wang, Y.S. Zheng, J. Pan and Y. Liu	569
Industrial Cluster Development and Social Responsibility: From Circular Theory Perspective	
Y. Cui and H. Jiao	574
Utilization of Improved RBF Network in Modeling of Wave Energy Absorption System	
Y. Zhang, M.X. Li and R.R. Wang	578
Features Linear Fusion Based on AP Clustering and AASC Algorithm	
L.M. Li and Z.S. Wang	583
Model and Algorithm for Thermal Performance Calculation of Power Station Boiler Based on Process Steady-State Simulation Theory	
H.K. Liao, Y.X. Yu, Y.L. Wu and W. Zhong	587
Blind Image Quality Assessment Using Latent Dirichlet Allocation Model	
W. Luo and T.B. Zhang	594
An Evaluation System of Pulsed GMAW Process	
Y. Gao, J.H. Han, L.Y. Lou and H. Li	599
Ontology Representation of Online Shopping Customers Knowledge in Enterprise Information	
Z. Li, S.S. Guo, Y.S. Yuan and L.B. Sun	603
Project Scheduling Problem with Stochastic Resource-Dependent Activity Duration	
C.J. Zhong, Y. Yu and Y.L. Jia	607
An Improved Ant Colony System for Inspection Path Planning Problem and Convergence Analysis	
W.B. Wang	611
Average Wage Prediction Based on Logistic Model	
Z.X. Wei, J.M. Liang and P. Zhao	615

Chapter 6: Control System Design and Evaluation

A Data-Driven Modeling Approach to Multi-Source Information Fusion System	
H.W. Quan, L. Zhang and L. Chen	621
Multi-Objective Control Method in Structural Stress Interval Reliability Based on Epsilon Algorithm	
Z.Z. Sun, G.W. Meng, F. Li and K. Ma	625
Precision Power System Harmonic Analysis Algorithm Based on ABC-BPNN	
S.C. Gan, L. Tang, L. Cao and Y.G. Yue	630
Numerical Simulation Research on Improving Effect of Steam Flooding by Using High Permeability Belt	
Y. Zhao, S.T. Lu, H. Gao and Y. Gong	635
Urban Environment Monitoring and Control System Design	
J. Xin and H. En	639
Alarm System for Ancient Tombs Based on ZigBee	
T. Wang and W.B. Liu	643
The Novel Approach "One Drive for Multi-Plate " in Lifting Garage System Design	
G.W. Chen	647
Control System Design of Ducted Fan Aerial Vehicle	
Y. Zhou, Z.X. Hou, S.Q. Shan and B. Wang	652
Finite Element Analysis of Pressure Balance Work over Rig Platform	
J.Q. Jin, Y.Z. Li and X.R. Wang	656

Run Risk Analysis of Solid Rocket Motor Waterjet Clearing System Q.L. Han, Z.M. Zhu, X. Gao and Q.Y. Zhang	660
Valuing Wind Power Project on Renewable Electricity Whole-Sale Tariff in Power Market J.N. Sheen	664
Research on Cooperative Scheduling and Design of Emergency Command System of Integrated Transport Hub X.M. Gong	668