

Table of Contents

Committees and Preface

CHAPTER 1: Nanomaterials

Fabrication, Characterisation and Application of Carbon Nanotube Polymer Composites L.C. Zhang	1
Influence of Multi-Walled Carbon Nanotubes on the Mechanical Properties of Nanocomposites S.C. Her and S.W. Yeh	9
Modeling of Piezoelectric Ceramics Based on Partial Least-Square Regression Method X.J. Zhu and Z.W. Zhu	13
Mesh-Free Numerical Simulation for Carbon Nanotubes upon Bending B. Gao, Y.Z. Sun and J.B. Wang	17
<i>Ab Initio</i> Study of the Structural and Mechanical Properties of Hf-Si-N X. Tan, Y.Q. Li, X.J. Liu and D.G. Liu	22
Nanocomposite Materials Design and the Sintering Optimization Based on Interface Strengthening F.Z. Yang, J.Q. Zhou, G.Y. Meng and C.H. Li	26
Influence of Nano-CaCO₃ on the Properties of Magneto-Rheological Fluid C.B. Du, G.J. Yu and W.Q. Chen	30
Study on the Preparation of Fe₃O₄ Nano-Magnetic Fluid for Seal B. Chen and Y.G. Fan	34
Hybrid Finite Element Formulation for Temperature Prediction in Carbon Nanofiber Based Composites H. Wang and X.J. Zhao	39
Effects of Immersion Time on the Electrochemical Impedance Spectroscopy Model of Epoxy Coating Modified by Nano-Sized Titanium X.Z. Zhang and Y.L. Du	43
Studies on the Growth Mechanism of Onion-Like Fullerenes by Arc Discharge in Liquid Benzene W. Liu and Q.S. Meng	47
A Self-Assembly Approach to Fabricate Bi₂S₃ Nanorods Y.F. Huang, Y.B. Cai and H. Liu	51

CHAPTER 2: Advances in Composites

Investigation on Drilling-Induced Delamination of CFRP with Infiltration Method Y.M. Quan and L.H. Sun	55
Tensile Strength Prediction of Woven Composite Bonded Joint J.Y. Zhang, Y. Fu, L.B. Zhao, H.F. Chang and B.J. Fei	59
Synthesis of Al₂O₃/AlB₁₂/Al Composite Ceramic Powders by High Frequency Induction Heating Method and a Study of Their Mechanical Properties K.J. Huang and C.D. Tan	63
Study on Mechanical Properties and Physical Properties of Copper Based Electrical Contact Materials Reinforced by CNT Z.Q. Guo, H.R. Geng and S.S. Feng	67
Penetrating Resistance of the Laminated Composite with Stepwise Graded Foam F.H. Sha	72
Carbon Fiber Paper Modified with Carbon Nanotube for Proton Exchange Membrane Fuel Cell X.J. Zhang, H. Pei and Z.M. Shen	76
Optical and Electronic Properties of Mn-Doped ZnO Films Synthesized by RF Magnetron Sputtering Z.F. Wu, Y.J. Cao, X.M. Wu and L.J. Zhuge	80

Mechanical Analysis of Unidirectional Fiber-Reinforced Polymers under Transverse Compression and Tension	
H.C. Qu, X.Z. Xia, H.Y. Li and Z.Q. Xiong	84
Effect of Core-Shell Particles on the Properties of Polystyrene/TiO₂ Nanocomposites	
X.M. Sang, P. Wu, X.G. Chen and G.X. Hou	90
Study on the Processibility of BMI for RTM Process and Mechanical Performance of Carbon Fiber Three-Dimension and Five-Direction Braided/BMI Composites	
Q.W. Guo, J.L. Li, G.L. Zhang, Y.H. He, M. Zhang and L. Chen	94
Experimental Study on the Tribological Behavior of CaCO₃/PEEK Composites under Water Lubrication	
Y.X. Lin, C.H. Gao and Y. Li	98
Effect of Sn on Glass Formation Ability and Crystallization Behaviors of Cu-Based Bulk Metallic Glass Alloy	
D.W. Zhang, X.Y. Teng, B. Li and W.J. Zhang	102
A Boundary Element-Free Method for Fracture Analysis of 2D Anisotropic Solids	
Y.Z. Sun, D.X. Li and H. Wang	107
Preparation and Performance of the Magnesium Matrix Composite Reinforced with Al₂O₃-SiO₂ Short Fibers	
J. Tian, W.F. Li, S.Y. Zhong and J.H. Peng	113
Study on the Anti-Oxidant Property of Copper Powder Coated Silane Coupling Agent in Isotropically Conductive Adhesives	
J.H. Zhong, Z.H. Li and L.Y. Ouyang	117
Tribological Properties of ZrO₂ Ceramics under Vacuum Condition	
R.P. Tong	121
Effects of Weaves on the Tribological Properties of Hybrid Kevlar/PTFE Fabric Composites	
Y.L. Yang, D.P. Gu and W. Deng	125
Effects of VA Content and Melt Index of EVA on Mechanical Properties of Wood Plastic Composites	
D.F. Li, L. Li and J.Z. Li	129
Stab Resistance of Thermoset-Impregnated UHMWPE Fabrics	
D.N. Wang, J.L. Li and Y.N. Jiao	133

CHAPTER 3: Materials Characterization

Stress Analysis of Composite Material Embedded with Optical Fiber Sensor Subjected to In-Plane Shear	
S.C. Her and B.R. Yao	137
Sintering Effects on LSCF Cathodes for Intermediate Temperature Solid Oxide Fuel Cells (IT-SOFCs)	
A. Muchtar, N.A. Hamid, N. Muhamad and W.R. Wan Daud	141
Electrophoretic Deposition of La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-δ} Cathode Film on Stainless Steel Substrates	
H.A. Rahman, A. Muchtar, N. Muhamad and H. Abdullah	145
Optical and Structural Properties of ZnS Thin Films Grown by CBD Technique	
H. Abdullah, N.H. Saadah, S. Shaari and A. Muchtar	149
Preparation of Titanium Dioxide Paste for Dye Sensitized Solar Cells (DSSCs)	
H. Abdullah, M.Z. Razali and M.A. Yarmo	153
Optimization of Heat Treatment Parameters with the Taguchi Method for the A7050 Aluminum Alloy	
C.C. Chang, J.G. Yang, L. Qi and C.P. Chou	157
Development of Electropulsing Treatment Device Based on Capacitor Energy Storage and Discharge	
J.Y. Zheng, W. He and R.J. Shen	163
Framework of Surface Integrity Model for Machined Components	
Q.R. Zeng, G. Liu, L. Liu and R.T. Tong	167
Effect of Weld on Axial Buckling of Cylindrical Shells	
Z. Fang, Z.P. Chen, C.L. Lu and M. Zeng	171

Sensing Analysis of Aluminum Alloy Materials Based on Chemical Acoustic Emission Signals	
Z. Cao, J.L. Zeng, Y.M. Dai, X. Li and D.M. Luo	176
Effect of Plastic Deformation on the Mechanical Properties and Microstructure of Homogenized AZ80 Magnesium Alloy	
Y. Xue, Z.M. Zhang and L.H. Lang	180
Characterization of Products from Pyrolysis of Waste Wood-Based Composites Containing Urea-Formaldehyde Resins	
Y.S. Feng, S.H. Chen and J. Mu	185
Study on the Elastic Properties of the Woven Fabric Liner of Spherical Plain Bearing with Self-Lubricating	
Z.L. Liu and X.J. Shen	190
Early Fatigue Damage of Magnesium Alloy On-Line Monitoring by Nonlinear Ultrasonic	
B.S. Yan, B. Wu, C.F. He and J.P. Jiao	194
Influence Analysis of Multifactor on LCF Damage of Single Crystal Nickel-Based Superalloy under Multiaxial Non-Proportional Loading	
Z.P. Ding, J.P. Chen, T.F. Wang and M. Li	198
Experimental Research of Prestrain Effects on Mechanical Behavior of Dual Phase Steel	
J. Meng, P. Zhu and Z.G. Hu	205
Research for Transverse Tension Distribution on Steel Strip in Continuous-Annealing Furnace Based on ANSYS	
J.X. Liu, H.M. Li, J.H. Li, Z.Y. Wu and Z.L. Zhan	210
Reflection and Refraction of Longitudinal Displacement Wave at Interface between Two Micropolar Elastic Solid	
B.B. Xue, H.Y. Xu, Z.M. Fu and Q.Y. Sun	214
Laser Brazing Diamond Grinding Wheel with Ni-Base Filler Alloy	
Z.B. Yang, A.J. Liu and J.H. Xu	218
Organically Modified MCM-Type Material Preparation and Its Usage in Controlled Ibuprofen Delivery	
H.X. Yang, B.W. Cheng, Z.H. Li, K.M. Su, Q. Guo and P. Han	222
The Refinement Effect of Al-Ti-C-RE Master Alloy Prepared by Adding Ce₂O₃ on Pure Al	
L.D. Wang, D.Y. Zhu, Z.L. Wei, L.G. Huang, W. Song and Y.L. Chen	227
The Influence of Boron on Structure and Mechanical Properties of Bainite Ductile Iron in the Step Austempering in Room Temperature Machine Oil	
D.Q. Wei	235
Research on Electroplastic Drawing Technology and Equipment	
D.L. Li, E.L. Yu and Z.T. Liu	239
Microstructure and Property of Rapid-Solidified Al-Si Alloys by Solution Treatment	
A.Q. Wang, J.P. Xie, W.Y. Wang, J.W. Li and L.L. Li	243
Preparation of Railway Concrete Sleeper Blended with Perlite Admixture	
L.H. Yu, H. Ou and S.X. Zhou	247
Pore Size Distribution and the Fatigue Properties of Several Cast Aluminum Alloys	
Y.B. Zhang, H. Luo and T.G. Zhai	251
Study on the Fiber Distribution and Fiber Orientation in Low Pressure Sheet Molding Compounds	
J. Li and Z.X. Huang	255
Transformation Behavior During Continuous Cooling of Mn-Mo-Nb-B Microalloyed Steel	
S.Q. Yuan and G.L. Liang	260
Prediction of Flow Stress of Stainless Steel 0Cr13Mn by RBF Neural Network	
B.L. Fan, L.Q. Meng and Z.F. Li	264
WC-Co Tool Failure Analysis and the Grinding Effect Study	
X.X. Zhao	269
Anti-Wear and Friction-Reducing Characteristics of Two Kinds of Ceramic Additives	
Y.Z. Gao, J.T. Wang, S.Y. Liu and H.C. Zhang	274
Study on Filling Capacity of Semi-Solid Magnesium Alloy	
Y. Hu	280
On Isotropic Damage Distributions and Evolutions of HRR Field	
W.C. Shi	284

Quantitative Analysis and Research of Cement Powder Mixing Based on Image Processing T. Ye and H.L. Yang	290
Research on Characteristics of Deposition Precipitation Process in Production of Low Carbon Aluminum-Killed Steel in FTSR Technology Y.L. Feng, M. Song and J.B. Yang	294
Comparison of the Electrochemical Behaviors Among 5083/6082 Friction Stir Welding Dissimilar Weld and Parent Materials C.B. Shen, Y. Chen and J.P. Ge	299
Study on Method to Dissected Data of Wood Cell Image S.Q. Zhang, W. Xu and Z.X. Meng	303
Study on the Ballistic Performance of Ceramic Composite Armor with Different Adhesive J.B. Gao, Y.W. Wang, L.Y. Zhang, G.F. Han and F.C. Wang	308
Accelerating Corrosion Test Study on Galvanized Q345 Steel X.H. Yang, D. Zhang and Y. Zhang	314
Corrosion Parameters Distribution Rule and Influence Factors of LY12CZ Aluminum Alloy Z.T. Mu, Z.T. Zhu, D.H. Chen and B. Ye	321
Study on the Quality of TA2 Sheet in Laser Bending Deforming Area Y.J. Zhou	326
Predicting the Wearable Property of YT 715 Cemented Carbide Cutting Tool S.Q. Chen and G.Y. Meng	330
Dry Sliding Wear Behavior of Sintered Copper-Diamond Composite Fabricated by Powder Metallurgy R.G. Zheng, Z.J. Zhan, X.T. Peng and W.K. Wang	335
Theoretical Analysis on the Bond-Slip Constitutive Relationship between FRP Bars and Concrete under High Temperature Z.Q. Wang, Z. Ju, Y.L. Han and X.J. Li	340
Study on Improving Cutting Tools Lifespan of W₆Mo₅Cr₄V₂ High-Speed Steel G.M. Li, L. Yan and S.M. Yu	344
Effect of Alkali Treatment of Coir Fiber on Its Morphology and Performance of the Fiber/LLDPE Bio-Composites H.S. Tan, Y.Z. Yu, L.L. Liu and L.X. Xing	348
Microstructures and Mechanical Properties of Weld Joint between B610CF and 16MnR Steel T.H. Zhang, H.C. Fu, P.J. Yan, F.W. Jin and Q. Wang	352
Creep Based Prediction Model of Stress Relaxation Behavior for High Temperature Materials J.Q. Guo, L.X. Wang and F.Z. Xuan	356
Research on Contact Fatigue Properties of Some Materials Used for Heavy Load Gear Y.X. Yu, B.L. He and E.Y. Shao	360

CHAPTER 4: Coatings and Surface Engineering

Finite Element Simulation of Laser Cladding Layer Crack by Micro-Regulation Forging J. Zhou, C.J. Qiu and D.W. Tang	364
Finite Element Analysis of Thermal Stress in Multi-Arc Ion Plated ZrTiN Hard Coatings P. Yan, J.X. Deng, H.B. Cui, X. Ai and J. Zhao	369
A Damage Cohesive Model for Simulating 90° Peel Propagation in Anisotropic Conductive Adhesive Bonding J. Zhang, Z.Y. Zhao and X.L. Wei	374
Corrosion Resistance of Brush Plated Pb/Ni Multilayer Coatings in a Simulated Environment of PEMFC J. Tan, Y.C. Qian, R.X. Xing and Z.X. Hu	378
Effect of Ultrasonic Impact Strengthening Treating on Microstructure and Properties of AZ91D Magnesium Alloy B.L. He, Y.X. Yu and Y.P. Miao	382
Analysis and Calculation of Electrodeposition Process of Zn Alloy Coatings Y.Y. Fan, D.H. Chen and X.J. Liu	386
Surface Modification by Electrical Discharge Machining of Sintered NdFeB Magnet L. Li, L.L. Qi, X.Q. Zhai and D. Wang	390

Study on the Green Remanufacturing of Ultrasonic Vibration Aided Hot-Dip Aluminizing and Micro Arc Oxidation Z.W. Niu, Z.Y. Li, F.F. Wang, J.Y. Zhang and A.H. Wang	394
Microstructure and Wear Resistance of the Composite Coatings Fabricated on Titanium Alloys by Laser Cladding Y.F. Zhang and J. Li	398
Effect of Current Density on the Microstructure and Mechanical Properties of TiN/TiAlN Duplex Coating Deposited on SKH51 Steel R.S. Du, J.H. Peng, X.W. Liang and J. Tian	402
The Investigation of Hot-Dip Aluminum and Micro-Arc Oxidation Multilayer Coating on 080A15 Steel Z.L. Zhao, J.L. Wang and Y. Liu	406
Investigation of Deposition Mechanism and Characteristics of Electroless Sn Plating R.D. Xu	410
Study on Tribology Performance and Wear Controlling of 9Cr2Mo Steel X.M. Jia and J.R. Chai	414
Liquid Film Performance Analysis of the Mechanical Seals with a Laser-Textured Micro-Pore Face X.Q. Yu, Q.G. Liu, H.Q. Gao and J.H. Yu	418
Microstructure and Properties of Laser Cladding Stellite 12/TiC/CaF₂ Composite Coating on Copper Substrate W.Y. WANG, X.M. Dong, H. Yan, J.P. Xie and A.H. Wang	422
Experiment and Simulation of Laser Shock Processing on Fatigue Crack Growth of TC4 Alloy Y.Q. Hua, Z.R. Cai, R.F. Chen, Y.X. Chen and H. Jiang	426
Effect of Laser Shock Processing on Fatigue Performance of 7075-T651 Aluminum Alloy R.F. Chen, H. Jiang, Y.Q. Hua, Y.X. Chen and Z.G. Cai	430
Investigation on RE Ion Nitro-Carbonizing Technology Used for 4Cr5MoSiV1 Casting Mold J.X. Kuang, X.H. Wang, A.M. Liu and H.J. Zhao	434
Friction and Wear Properties of Ti-6Al-4V Surface Modified by Nitriding-Mo Plating-Sulfurizing Composite Treatment L.J. Wang, J.S. Yang and Y.Z. Xing	439
Study on the Combined Anticorrosion Method of Thermal Spraying and Coating of Carbon Steel in Deposit Water of Storage Tank Y.Z. Zhou, C.Y. Yang, J.M. Zeng, X. Ni, D.S. Chen, W.J. Wei and B.Q. Gu	443
Study on Fretting Wear Behavior of 40CrNiMoA Steel Z.J. Li	447
The Influences of Anticipated Heat Treatment on the Electroless Nickel Plating on Magnesium Alloys X.Z. Zhang, Y.J. Li, X.W. Duan, Y.W. Shao, J.B. Xiong and J.S. Liu	452
Numerical Analysis of Thermal Residual Stress in Diamond Film Deposited on Molybdenum Substrate C.L. Liu and D.P. Tang	456
Preparation and Process Optimization of Ni-Ti-B Coating with Fretting Damage Resistance D.L. Song, Y. Li and L.L. Yang	460
Research on Nano-Coating Absorption Application in Laser Processing Y. Yang, Y. Zhang and T. He	464
Effect of Rare Earth on Microstructure and Properties of the Self-Propagating Spraying Coating L.X. Yue and Z.Y. Hao	468
Camouflage Coatings Design and Optimization of Construction Machinery Y.G. Shen, L.L. Dai, N.Y. Zhang and G.W. Wei	472

CHAPTER 5: Materials Forming

Inline Rolling of 5182 Aluminum Alloy Strip Cast by a Vertical Type High Speed Twin Roll Caster R. Nakamura, S. Hanada, S. Kumai and H. Watari	477
Roll Casting of Al-SiC_p Composite Strip R. Nakamura, T. Nakamura, R. Nakamura, H. Harada, S. Kumai and H. Watari	481

Compaction Experiment on the Newly Designed Warm High Velocity Compaction Equipment	485
C.Y. Tang, Z.Y. Xiao, J. Chen, C.J. Li and T.L. Ngai	
Numerical Simulation of Forming Force in Tube Multi-Point Forming	489
Q.Q. Liu, W.Z. Fu, M.Z. Li, Z.H. Chen and X.P. Gong	
Glass Forming Ability and Non-Isothermal Crystallization Kinetics of $Zr_{64}Al_{10.1}Cu_{11.7}Ni_{14.2}$ Metallic Glass	493
W.K. An, A.H. Cai, Y. Luo, T.L. Li and X.S. Li	
Corrosion Behavior of $Cu_{60}Zr_{30}Ti_{10}$ Amorphous Alloy	498
A.H. Cai, W.K. An, Y. Luo, T.L. Li and X.S. Li	
Experimental Research on Strain Distribution Characteristics of Thin-Walled Rectangular Tube in Rotary-Draw Bending	502
S. Tian, Y.L. Liu, G.Y. Zhao and H. Yang	
Study on Pressurizing Velocity and Model of Vacuum Counter-Pressure Filling Process	506
Q.S. Yan, H. Yu, Z.F. Xu, B.W. Xiong and C.C. Cai	
Application of Ductile Fracture Criterion in Hot Forging Damage of Mn18Cr18N Steel	510
X.W. Duan, X.Z. Zhang, X.P. Wei, J.S. Liu, W.W. He and J.H. Tian	
Hot Deformation Behavior of 316LN Stainless Steel	516
W.W. He, J.S. Liu, H.Q. Chen and H.G. Guo	
Deformation Behaviors of AZ31B Magnesium Alloy Sheets in Hydraulic Deep Drawing	520
L.F. Yang, L. Yi, X.C. Mao and G. Chen	
Study on the Technological Adaptability of the Reclaimed Sand Applied in the Chemical Bonded Sand	524
Q.Z. Sun, R.F. Xu, Z.K. Zhao, P.Q. Zhang and W. Liu	
Effect of Different Processing on Properties of Silica Sand	528
Q.Z. Sun, R.F. Xu, Z.K. Zhao, P.Q. Zhang and W. Liu	
Study on Accuracy Improvement of Vehicle Crash Simulation Considering Stamping Effects	532
H.B. Du, P. Ye, D.Z. Wang and X.D. Tang	
Experimental Study on Influencing Factors to Drive Line of Box-Shaped Part with Curved Bottom	536
X.L. Hu, N. Yang and Z.W. Xing	
Optimization by Grey Relational Analysis of EDM Parameters on Machining Ti-6Al-4V	540
Z.P. Xie, J.M. Zheng and B.L. Quan	
Hot Deformation Behavior during the Hot Compression of AZ31 Alloy	545
S.L. Sun, M.G. Zhang, W.W. He, J.Q. Zhou and G. Sun	
Numerical Simulation of Back Pressure Influenced Aluminum Component's HPDC Process	549
W.J. Cao, Z.Y. Zhou, Y. He and Y.B. Wu	
The Shape Distortions Formed in Flat Bottom Punch Raising Process with TC2Mδ1.53 Titanium Alloy Sheet	553
L.Y. Zhang, B.B. Zhang and F.S. Qiu	
Properties and CA4GE-Engine Test of TiAl-Based Alloy Valves by Permanent Mold Casting	557
W.B. Sheng, C.X. Ma and W.L. Gu	
Research on the Blank Used in Integral Forming of a Lager Head with Supporting Table	561
H.P. An, J.S. Liu, J.G. Wu and J.H. Tian	
Experimental Research on Impact Line of Hyperboloid Shallow Shell	567
L.H. Zhao, Z.Y. Ren, S.Y. Jiang and N. Yang	
Crush Performance of Top-Hat Tubular Structures Considering Different Forming Conditions	571
J.H. Niu, P. Zhu and Y.J. Guo	
Application of Numerical Simulation on Cast-Steel Axle's V-Method Foundry	576
G.F. Mi, L.L. Chen and H.Y. Nan	
Research and Prospects of Laser Welding Technologies of Magnesium Alloys	580
B.L. He and J. Liu	
Gap Setting Model and Application in Plate Rolling Process	584
Z. Zhao, C.L. Jia, X.L. Hu, G.D. Wang and Z.H. Zhu	

The Research for Drawing Process of High-Speed Railway's Track Template H.L. Sun, J. Yin and R. Ma	589
Prediction of Springback in Metal Forming of Diaphragm of Automotive Horn Based on BPANN Y.Q. Zhang, S.Y. Jiang and Y.F. Zheng	594
Role of Material Properties in Improving Sheet Formability in SPIF Process G. Hussain, N. Hayat and L. Gao	600
Thermal Deformation Behavior of 1Cr12Ni3Mo2VNbN Alloy and Its Application in the Blade Forging J. Zhong, C. Guo, P. Yue and C.L. Long	605
Effects of Steel Coatings Microstructure on Weldability in Resistance Spot Welding of Galvannealed Steel Sheets X.B. Hu and X.P. Zhou	610
Finite Element Simulation for the Stress of Cavity Die Wall in Tube Open-Die Cold Extrusion Process W.C. Pei, J. Han and Y.G. Li	614
Study on Formability of Tailor-Welded Blank Based on Sheet Metal Matching J.L. Wang, F.C. Lan and J.Q. Chen	618
Study on the Casting Process of the Large-Scale High-Chromium Cast Iron Impeller F.L. Qiao, Y.M. Yin and X.H. Zhi	622
Three-Dimensional Numerical Simulation and Forming Investigation for Net-Shape Forging of Spur Gears S.B. Xu, C.N. Jing, G.Q. Wang and G.C. Ren	626
Numerical Simulation of Multi-Component Powder in Selective Laser Sintering J. Zhang, D.Y. Li, W. Fu and L.Z. Zhao	630

CHAPTER 6: Novel Material Fabrication

On Cutting Process of Stainless Steel Fiber with Complex Surface Morphology B. Tang, Y. Tang, R. Zhou and Z.P. Wan	634
Numerical Simulation and Sensitivity Analysis for Tube Hydropiercing Quality Based on Experiments Z.G. Wu, S.H. Li and W.G. Zhang	639
Equation of Equilibrium Moisture Content of Wood under Vacuum by Regression Analysis S.L. Yi, Y.D. Zhou, Z.B. He, X.J. Feng and B.G. Zhang	645
Preparation and Properties of Low Formaldehyde Emission Plywood with Flame Resistance S.F. Zhang, F. Song, Q. Gao and J.Z. Li	649
Study on Fractal Characteristics of Primary Phase Morphology in Semi-Solid A356 Alloy Z. Liu and X.M. Liu	653
Research on Semi-Solid Y112 Alloy Fabricated by Mechanical Stirring H. Yan and Y. Hu	657
The High Temperature Gel Permeation Chromatography Study on Poly (Phenylene Sulfide) Linear Chain Propagation Y. Zhou, B.W. Cheng, Z.H. Li, D.X. Shen, S. Zhang, H.L. Feng, L. Zhang and M.L. Zhang	661
Influence of Duty Cycle on Composition and Microstructure of Siliconized Layer Using Pulse Electrodeposition H.L. Yang, Y. Li, Y.G. Li, G.Z. Tang, N. He and Y.Z. Zhang	666
Effects of N Content on Microstructure and Properties of SAF2906 Casting Super Duplex Stainless Steel after Cryogenic Treatment H.L. Xiang, D. Liu, W.L. Huang and F.S. He	670
Effect of Ultrasonic Treatment on Microstructures of Mg-Ca Binary Alloy Z.Q. Zhang, Q.C. Le and J.Z. Cui	677
Machining Process of Titanium Alloy Based on Green Cooling and Lubricating Technology Y. Zhang, L. Han, Q.D. Li, T.L. Sun and X.C. Zhang	681
Internal Oxidation of Rare Earth Additive Accelerating Aluminized Layer on Copper Matrix B.H. Tian, Y. Zhang, Y. Liu and F.Z. Ren	685
A New Spectral Analysis Technique Used in Converter Steelmaking BOF Endpoint Control L.F. Xu, W.S. Li, S.X. Xu, J. Li and Y.Q. Wang	689

Research on Effect of La on Microstructure in Semi-Solid A356 Alloy X.M. Liu, Z. Liu and Y.M. Hu	693
Study on Influences of Injection Process Parameters on the Mechanical Properties of the Modified Polypropylene Products with Weld Lines Y.Q. Qian, Y.S. Sun, X.T. Xiao and G.H. Yang	698
Experimental Research on Deep Cryogenic Treatment Process of YT30 Cemented Carbide Inserts H.J. Yan, H.H. Xu and X.M. Li	702
Preparation and Application of Modified Soybean Protein Adhesives Z.T. Sang, S.F. Zhang, Q. Gao and J.Z. Li	706
The Study on a New Wood-Based Carrier of Controlled and Release of Fertilizer J.F. Duan, J.Z. Li and L.P. Zhang	710
Implementation of Distributed Control for Smelting Furnace and Mixed Gas Processes X.Q. Zhu	714
Modification Microstructures in <i>In Situ</i> Mg₂Si Reinforced Al-Si Alloy Composites Q.X. Jing, G.F. Deng and Y. Liang	718
Research on Preparation of Topological Type PMMA by Atom Transfer Radical Polymerization T.T. He and Y. Yang	723
 CHAPTER 7: High-Speed/Precision Machining	
Tool-Swinging Cutting of Binderless Tungsten Carbide Z.Y. Zhang, J.W. Yan and T. Kuriyagawa	727
Optimization of Thermal Performance of Hybrid Journal Bearings for High Speed Machine Tool Spindle with Small Diameter X.B. Yang, W.L. Xiong, Z.Q. Hou and J.L. Yuan	731
Automatic Polishing Technology on Free Surface by Grinding Center X.J. Wu, S.D. Sun and C. Zheng	739
Research on Adiabatic Shear during Serrated Chip Formation of High Speed Turning of Hardened Steel C.Z. Duan, H.Y. Yu, M.J. Wang, B. Yan and Y.J. Cai	743
Effect of Cutting Conditions on the Stability Lobes for End Milling Process M. Wan, Y.T. Wang, W.H. Zhang and J.W. Dang	748
A New Type of Servo Direct Drive Turret Punch Press K. He, J.H. Li, X.F. Ou and R. Du	752
351nm Excimer Large-Area Lithography by Scanning and Projection J.Y. Zhou, Q. Ouyang, Q.H. Lin and W.Y. Pei	758
A New Method for Temperature Measurement to Determine the Temperature Variation in Cylindrical Grinding Contact Arc B.Z. Li, D.H. Zhu, J.Z. Pang, Z.X. Zhou and J.G. Yang	762
The Simulation of Cutting Force and Temperature in High-Speed Milling of Ti-6Al-4V Z.C. Yang, D.H. Zhang, X.C. Huang, C.F. Yao and J.X. Ren	768
Research on Overhanging Rigidity and Auxiliary Support Characteristics of the Large and Exact NC Rotary Table C.J. Yu, X.D. Huang and R.J. Hong	772
The Technology Research of CO₂ Laser Micropore Drilling on Carbon Steel D.M. Chen, Z.G. Li, J.J. Li and J.X. Li	777
Experimental Study on the Relationship between Surface Roughness and Cutting Parameters when Face Milling High Strength Steel Y. Ding, W. Liu, X.B. Wang, L.J. Xie and J. Han	782
Micro-Positioning Platform Based on Giant Magnetostrictive Material Q.G. Lu, D.F. Chen, J.Q. HU and Y.P. Zhao	788
Study on Dynamic Design Technique of Machine Tools Structure Based on Energy Balance N.N. Zhang, Z.Y. Weng, Y.Q. Zheng and Y. Cai	792
Optimal Design and Process Analysis of the Blade for High-Speed Shearing Stainless Steel Tube J. Sun, Y.L. Wang and B. Lu	797

The Influencing Factors on the Axial Magnetic Field Distribution Characteristics of GMA X.Y. Jiang, Q.G. Lu, D.F. Chen, M.L. Tao and M. Zhou	801
Machinability Investigation in High Speed Turning of Powder Metallurgy Nickel-Based Superalloy with Sialon Ceramic Inserts Y. Qiao, X. Ai, Z.Q. Liu and J. Zhao	805
Study on Technology of Drilling Superfine Deep-Hole in 2Cr13 T.Q. Wang, Z.F. Liu and C. Zhang	809
Design Principle's Research of Traction Gear's Modification Slotting Cutter of High-Speed Locomotive C.G. Chen, L.B. Hu, B.W. Li and S. Li	813
The Design of DF-Windspout Separator Cleaner P.M. Dong, T.Q. Wang, G.Z. Li, J.L. Zhang and Z.G. Yao	819
The Key Technology of Hob Design for Hobbing Screw Compressor Rotors with Cycloid-Arc Profile B.S. Ouyang, G.X. Lin and C.L. Zhang	823
Milling Force Forecast of the Matching of Lengthened Shrink-Fit Holder and Cutter in High Speed Machining H.M. Zhou, J.X. Deng and W.W. Xie	827
Preliminary Study on Deep-Hole Drilling Gamma Titanium Aluminide L. Zhu, X. Chen and B. Viehweger	831
Influence of Cutting Speed on Cutting Force in High-Speed Milling Z.Y. Zhao, Y.S. Xiao, Y.Q. Zhu and B. Liu	835
Performance Comparison of Aerostatic Gas Bearings of Two Different Gas Supply Modes A. Sun and Z.W. Wang	839
Evolution of Surface Roughness of Ti Plate in Abrasive and Abrasive-Less Polishing Q.L. Han and B. Zhang	844
Building of Ultrasonic Vibration Precision Cutting System and Experimental Study of Cutting for Plastic Material L. Yang and K. Gao	848
Design and Research of Amplitude Transformer in Ultrasonic Vibration Drilling System Z.F. Liu and Y.Z. Feng	852
Optimization of Ultrasonic Honing Acoustic Subsystem Y.D. Zhang, L. Zhou and C.Q. Xi	857
Investigation of Cooling-Air Grinding Performance by Finite Element Analysis and Experiments Y.L. Cai, H. Zhang, Y.F. Liu, H.H. Zhao, J. Yao and H.T. Huang	863
Adaptive Integral-Type Sliding Mode Control for Magnetic Levitation Linear Guide Suspension Altitude J.F. Mao, G.Q. Wu, A.H. Wu and Y. Cao	867

CHAPTER 8: Bionic Mechanisms and Bio-Manufacturing

The Morphological Characteristics and Composition of Body Surface of Ant and its Relation to Reducing Soil Adherence D.W. Zhang, Y.X. Wang, Y.Q. Tang and W. Zeng	872
Fluctuation of Biped Walking Mechanism Based on a New Two-Level Type Half-Rotating Mechanism S.B. Ou, Z.Z. Qiu, X.Y. Wang and L.Y. Hou	877
Influence of Contractive and Dilative Motion of Blood Vessel to Robot F. Jiang, J. Yu and Y.J. Wang	881
Surface Structure Research and Design of Drum's Coating Layer Based on Bionic Tribology L.J. Xiao, X.J. Wang, X.H. Sui and L.F. Zhuang	885
Simulation for Needle Deflection and Soft Tissue Deformation in Needle Insertion D.D. Gao and H.J. Zheng	889

CHAPTER 9: Modeling, Analysis and Simulation of Manufacturing Processes

Meshless TL and UL Approaches for Large Deformation Analysis Y.T. Gu	893
Simulation Research of the Condenser in a 600MW Supercritical Thermal Power Plant Y.Y. Zhao, Y.P. Zhang, W. Deng and S.H. Huang	897
Fast Deformation of Skeletal Muscle Using Constraint Functions X.X. Liang	903
Modeling of V-Shape Linear Ultrasonic Motor Based on Hammerstein Model J.T. Zhang, T.M. Zhang and D.B. Kong	908
Flow Analysis of Spray Jet and Direct Jet Nozzle for Fire Water Monitor G.L. Hu, W.G. Chen and Z.G. Gao	913
Analysis of Cutting Forces in Helical Ball-End Milling Based on Coordinate Conversion W.G. Wu, G.C. Wang and C.G. Shen	917
Analytical Modeling of Residual Stresses in Burnishing J. Zhao, W. Xia, F.L. Li, Z.Y. Zhou and Z.Q. Tang	921
Dynamic Analysis of Ball Vibration Assisted Burnishing F.L. Li, W. Xia, Z.Y. Zhou, J. Zhao and Z.Q. Tang	925
Genetic Optimal Design of Straw Crusher Based on ADAMS L.Q. Chen, J.Q. Zhang and X.L. Kong	929
A Nonlinear Dynamics Bond Graph Model of Gear Transmission J.Y. Tang, H.F. Chen and S.Y. Chen	933
The Finite Element Analysis and Optimization of Micro Free Piston Swing Engine's Strain Interference J.J. Lin and Y.H. Chen	938
Modeling and Analysis of Main Drive Train in a Power-Driven Turret W. Zhang, B.B. Sun and X.B. Kang	943
Velocity and Load Characteristics Analysis of Pump-Control-Motor Hydraulic Drive System M. Long, A.M. Hu, Z.G. Gao and X.J. He	947
Integrate and Optimized Design of a Hydraulic Underwater Manipulator X.C. Wang, R.Y. Song and C.J. Wang	952
A Desktop Virtual Reality-Based Interactive Tunnel Boring Machine Simulation System G. Li, Y. Cao, Y. Yao and W.S. Wang	957
Simulations of Thermal Behaviors on a Power-Driven Turret K.H. Jiang, B.B. Sun and X.B. Kang	961
The Changing Law of Tooth Bending Stress for Herringbone Gears with High Contact Ratio L.H. Chang and G. Liu	965
Research of Deformation Process Control of Generator's Retaining Rings on Hydraulic Bulging Strengthening Technology X.L. Zhao, J.S. Liu and W.W. He	970
Thermal Equilibrium Analysis of Loaders' High-Pressure Hydraulic System X.B. Wang, S.M. Chen, H.T. Huang and J.W. Zhuo	975
Numerical Coupling Analysis of Droplets' Behaviors in GMAW Y.L. Huang, X.Y. Ke and Y.B. Li	981
Effect of Adhesive Layer's Voids on Stress Distribution of Adhesively Bonded Joints H.L. Zhao, Z.Z. Gao, Z.F. Yue and Z.F. Jiang	986
Forecasting and Parameters Optimization of Reflow Soldering Profile Based on BPNN and GA E.S. Pan, Y. Jin, H. Xu and W.Z. Liao	990
Dynamic Analysis and Experiment Validation of Linear Motion Guide Having Rolling Elements for NC Machine Tool Y.M. Zhang, Z.K. Xie and Q.W. Liu	996
Dynamic Multibody Simulation of a 6-DOF Robotic Arm B. Li, X.F. Yao, C.B. Wang and H.D. Lou	1001
Reliability Study for Creep Life of Single Crystal Turbine Blade under Random Crystal Orientations and Random Loads Z.Z. Gao and Z.F. Yue	1005

Development of Hydraulic Control Jam Release Device for Workover G.Z. Jia, S. Wang and F.C. Zhang	1010
Computer Simulation for the Orthogonal Milling Process of Asphalt Concrete L.Q. Zhou, Y.P. Li, H. Liu and G. Xing	1014
A Study on Design of a Breech Mechanism Test-Platform Drive J.J. Yao and J.S. Ma	1018
The Ontology Mapping Technology Based on the Information Coding Ontology Model J.J. Jiang, J.B. Wang and N. Liu	1022
The Flow Analysis of Automotive Power Steering Gear Assembly Based on Fluent K. Cheng, T.Z. Li and G.M. Li	1028
Analytical Comparison of Structures of Heavy Gas Turbine Rotor's Support W.L. Sun, Y.B. Zhang and J. Guo	1032
3-D Numerical Simulation and Experiment Study on the Wear of Piston Ring-Cylinder Liner J.P. Zhang, Y.K. Jiang, X. Liu and Z.L. Dong	1036
Study of Pressure Pulsations Attenuation in Hydraulic System Z.Y. He and Q.H. He	1040
A New Method for Process Plan Reasoning in Injection Mould Repairs Y. Wang	1044
Numerical Simulation of the Flow Field in Cavitations Nozzle for Impinging Streams Reactor Q. Li, H.L. Wang and F.B. Li	1048
The Simulation about Collision of the Truck Fence Y.B. Zhang and E.H. Zhang	1052
Modeling and Kinematics Characteristic Analysis of Twist Beam Rear Suspension Using ADAMS/Car A.H. Tang, O. Jian and G.H. Deng	1056
Reliability Simulation and Prediction of Mechanical Equipment for Maintenance L.P. Huang, Z.L. Gong and W.H. Yue	1060
Design of Y422 Retrievable Fracture Bridge Plug and Analysis of Slip Characteristics D.X. Li, H.L. Zhao, X.L. Liu, S.J. Zheng, D. Geng and S.M. Zhang	1064
Optimization Design of the Composite Hub Connection Structure Based on ANSYS Software Technology H. Sun	1068
A Framework Based on Support Vector Regression for Robust Optimization B.Q. Yao	1073
Finite Element Method Analysis and Optimal Design of Roller Convexity of Tapered Roller Bearing Z.W. Wang, L.Q. Meng, W.S. Hao and E. Zhang	1079
Revision of Tooth Surface in Order to Compensate the Load Deviation of the Plastic Gears H.R. Liu	1084
FEM Simulation on Cold Rolling of Outer Spherical Bearing Ring X.T. Zhao	1088
Study of the Geometrical Error Modeling of NC Lathe Based on Multi-Body System Theory X.S. Wang, Y. Li and Y.C. Yu	1093
The Dynamic Simulation Analysis of the Vehicle Safety Belt Retractor X.Y. Zhao, Y.F. Xing and B. Zhao	1097
Mechanics Model and Finite Element Simulation of High Speed Orthogonal Cutting of Titanium Alloy Y. Yang, Y.L. Wang and C.H. Li	1101

CHAPTER 10: CAD/CAM/CNC

The Study on Framework and Functions of Integrated Design Environments for Preliminary Design C.D. Xu, C.S. Hu and X.B. Cao	1105
Integration of 3D-Routing for the Design of Molded Interconnect Devices Y. Zhuo	1109

CAD/CAE Technology and its Application on Nonferrous Alloy Casting D.M. Liao, L.L. Chen, J.X. Zhou and R.X. Liu	1113
Integrated CAD/CAM Software for Steel Tubular Truss Structures Z.Q. Wang, X.Q. Luo, J.M. Hu and Z.L. Yang	1117
Design and Study of Heavy Tipper Multistage Hydraulic Cylinder Based on CAD/CAE X.H. Sui, D.J. Miao and Z.M. Feng	1122
A Variant Design Method of Assembly F.Y. Liu, N.Y. Lu and B. Kuang	1126
Research on Variant Design Method of Dimensional Tolerance Based on Parametric Technology L.Z. Xiao, B. Kuang, F.Y. Liu, M.F. Huang and J. Zhang	1131
Study on Logistics-Oriented Product Innovative Design C.S. Zhou, W. Zhao and K. Zhang	1136
Research on Method of Knowledge Classification for Supporting Product Creative Design T. Li, W. Zhao and Y. Zhang	1142
Knowledge Support Technology of Creative Design for Electromechanical Products K. Zhang, W. Zhao and C.S. Zhou	1148
Tooth Contact Analysis of Face Gear Drive Modified by a Grinding Worm H. Guo, N. Zhao and H. Gao	1154
Sphere Image Representation of Triangular Mesh and its Application X.L. Bai, S.S. Zhang, Y.K. Ma and K.X. Zhang	1158
Determination of Multiple Clamping Forces Using the Rigid Body Model G.H. Qin and Y.M. Lu	1164
Information Extraction Method for a STEP-Compliant NC Program G.Q. Yuan, C.R. Zhang, Y.C. Zhang and R.L. Liu	1169
Applying Element-Free Galerkin Method to Simulate Die Forging Problems D. Li, J.C. Xu and W.Q. Kang	1174
Development of Three-Dimensional Parametric Modeling for Milling Process Simulation J. Sheng, G.G. Zhang and H.H. Zhang	1178
Study on Key Technologies of Practical DNC System S.F. Zhang, C.J. Ji, Z.H. Sha and C.H. Ma	1184
Algorithm Study on Orientation Planes Identifying Based on KBE of Gear-Box Parts Z.Y. Liu and E.F. Liu	1188
Multiobjective Optimization Using Fitness Function and Sequence Approximate Technology Z.S. Jiang and H. Jiang	1192
Optimization Design for Planet Carrier of Planetary Gear Reducer Based on ANSYS S.Z. Zhou, C. Li, T. Xing and C.B. Li	1196
Numerical Simulation of Cold Heading and Extruding for Spiral Bevel Gear Y.Y. Chen, W.J. Feng, Y. Yang and Y. Du	1202
Elliptical Gears Parametric Design and Motion Simulation C.B. Hu, F.Y. Tian and Y.C. Jiang	1206
The Research on Part Information Model of Injection Mold CAD/CAPP J.L. Hao, K.L. Li and H.M. Zhang	1211
Study on Cutter Trace Calculation and Interference Checking for Complex Surfaces NC Machining Z.Y. Duan, W.Z. Zhao and W.H. Zhao	1215
Visual Design System Development of Wellhead's High Pressure Valve M.Q. Li, Y. Huang, M.L. Duan and S.Z. Zhou	1219
Vibration Analysis of Ball Screw Drive System for CNC Machine Tool Y.W. Zhang and W.M. Zhang	1224
Automatic Planning Approach of Auxiliary Clamping Points of Rapid Fixture in Thin-Walled Parts T. Wen and Q.X. Hu	1229
Automatic Programming System for Machining Center On-Line Inspection J.J. Meng, F. Liu, H.Q. Sang and J.T. Yun	1233
Basic Research on Five-Axis NC Machining of Subdivision Surface H. Yuan, X.L. Lu and R.J. Hong	1237

CAD-CAM Prosthesis in Maxillo-Facial Surgery S. Sekou, S.Y. Zhong, G.H. Xu, W.P. Wang and J.J. Zhou	1241
Methods of Cam Structure Optimization Based on Behavioral Modeling Y.X. Liu, R.S. Peng, A.H. Hou and D.W. Tang	1245
Fatigue Analysis of a Self-Propelled Steel Bridge for Life-Customized Design W.P. Peng, M. Peng, Z. Liu, Y.H. Wei and R. Xia	1249
Research on Solving Method for Tooth Crest Curve of Spiral Bevel Gear under Form Milling X.T. Wei, J.C. Liu and Q. Du	1255
A New Method for Deformation of B-Spline Surfaces X.G. Cheng and W.J. Liu	1260
A Study on the Technology of Helical Groove Formation R.S. Lu, B. Yao, B.S. Yao and M.H. Chen	1264
An Automatic NC Programming System for Mould-Electrode Based on PowerMill J.H. Tao, F. Zhang and X.C. Liu	1268
Cutting Parameters Optimization to Reduce Errors in Milling Mould M.H. Zhang	1272
Automatic Design Method of Wind Turbine Tower and it's Application D.H. Su, M.Y. Zhang, T.Q. Ma, X.Q. Han, C.Z. Sun and X.D. Wang	1277
A Design-Analysis and Simulation Approach of Ball-End Cutter Based on OpenGL M.F. Liu, X.H. Guo and H.X. Han	1281
Dynamic Analysis on the Rotating Band's Engraving Process H.Y. Sun, J.S. Ma, J.J. Yao, H.P. Liu and W. Li	1285
A Comprehensive Tolerancing System for 3D Mechanical Assemblies D.Y. Yang and J. Gong	1289
Data Integration of CAD, CAE with CAM for Composite Structures L.H. Zhang	1294
CAD/CAM of Clothing Laser Cutting J.X. Qiu, Y.Q. Xu and Y. Li	1299
Study on Process of Particle Impact on Curved Surface of Vane by Finite Element Method X.J. Yang, Y.L. Chi and G.Z. He	1303
The Optimal Design of Multi-Level Planetary Gear Reducer J.B. Wu, L. Shu and H.M. Cheng	1308
A Method of Three-Dimensional Modeling Based on Voxel Code A.D. He and B.Y. Ye	1312
A Nonlinear Mathematical Model for Turning Parameter Optimization Based on Minimum Production Cost L.B. An	1317
An Algorithm for Generating Multi-Axis NC Machining Tool-Path on Scattered Point Cloud D.Z. Sun, J. Liu, Y.R. Li and Z.W. Niu	1322
Principal Curvatures and Cutter Location Calculation of Six-Axis CNC Abrasive Belt Grinding Machine G.L. Wu and Q.J. Zhang	1328
 CHAPTER 11: Virtual Manufacturing and Concurrent Engineering	
Research on a Platform for Developing Virtual Prototype of Automatic Transmission J.M. Xiao, X.K. Wang, J. Lei, Q.N. Lai, J.J. Sun and Y. Lou	1333
Key Technologies of the Customization Product CAD/CAE Integrated Analysis System Y.X. Wang, X.Y. Ni and Z.L. Wang	1337
Extending Activity Overlapping Model Based on Design Structure Matrix T.G. Chen	1341
Semantic SOA for Missile Design X. Song, J.J. Li, L. Zhang and D.J. He	1345
Research on the Relationship between Virtual Manufacturing and Digital Factory E.S. Qi, H. Li and L. Liu	1350

A Haptic-Based Approach for Cable Design and Routing in Industrial Complex Products G. Sun, P.J. Xia, Y. Li, W.M. Yi and L. Huang	1356
Integration of Multi-View Data Based on Auxiliary Reference Plane K.W. Lin, X. Liu and M.D. Duan	1361

CHAPTER 12: Green Design and Manufacturing

Improvement of Vehicle Crashworthiness for Full Frontal Impact Based on Energy Flow Analysis H.L. Wang, D. Xiang, L.F. Jiang, G.H. Duan and H.C. Zhang	1365
Study on a New Method of Cleaner Process Design and its Application Y. Liu, Y.F. Xu and R. Huang	1370
An Efficient IT Energy-Saving Approach Based on Cloud Computing for Networked Green Manufacturing L. Ren and L. Zhang	1374
Experimental Study on the Applicability of Minimum Quantity Lubricant Grinding G.Y. Meng, J.W. Tan and Y. Cui	1378
Tube Bus Corona Optimal Design of HVDC Converter Substation M.M. Xu, K.J. Li, L. Niu, M. Liu and Z.H. Guo	1384
The CBR-Based Green Design Evaluation System for Mechanical Products Q.Z. Niu, Y.F. Fu, Z.G. Wang and F. Hong	1388
Rolling-Plowing-Extrusion of Outside 3D Integral Fins on the Stainless Steel Tube X.X. Zhang, Y. Tang, Z.P. Wan and S.L. Tao	1392
Application of Multidisciplinary Design Optimization Based on Approximation Model to Marine Supercharger Turbo L. Li, Z.Z. Lv, L.B. Ao, M. Yu and Z.F. Yue	1396
Bend-Twist Coupling Design and Evaluation of Spar Cap of Wind Turbine Compliance Blade W.Y. Liu and Y. Zhang	1400
Weight Reduction Design of Gear Drive Based on Parameter and Structural Optimization P. Wang, Z. Lan and X.Y. Shen	1406
Optimum Design on Screw Parameters of the Twin Screw Pulping Extruder Based on the Extrusion Model X.Y. Shen, Z.J. Zheng and P. Wang	1411
Green Scheduling and its Solution J.J. Yu	1415
Polymerization Craft of Wood-PSt Composite and its Performance Y.L. Fu, Y.F. Li, Y.X. Liu and B.G. Wang	1419
Laser Remanufacturing Technology and its Applications W. Wang, Y.X. Liu, F. Xing and H.L. Xie	1424
Research on Multi-Step Active Disassembly Method of Products Based on ADSM Z.F. Liu, L.X. Zhao, X.Y. Li, H.C. Zhang and H.B. Cheng	1428
Numerical Analysis for Thermal Performance of High Power Multi-Chip LED Packaging K.L. Pan, J.P. Wang, J. Liu and G.T. Ren	1433
Application of Reverse Engineering Technology in the Green Remanufacture Engineering W. Fan, X. Liu and W.D. Wang	1438
A New LCA Method Based on Multi-Scenarios Coexistence X.W. Wang, J.F. Li, J.Z. Li and R.J. Zhang	1442

CHAPTER 13: Digital and Agile Manufacturing

Human-Computer Collaborative Service Composition for Service-Oriented Manufacturing Integrated Systems B.L. Wang, L. Zhang, Y.L. Luo, Q.C. Zhang and H. Guo	1446
Research on the Measurement Method of Flexibility of Resource Service Composition in Cloud Manufacturing H. Guo, L. Zhang, F. Tao, L. Ren and Y.L. Luo	1451
Research on Case-Base in Semantic SOA Integrated System Q.C. Zhang, L. Zhang, Y.L. Luo and B.L. Wang	1455

A New Data Reduction Algorithm with Preserved Features B.Q. Shi, J. Liang, Q. Liu, Z.Z. Xiao and X.Q. Zhang	1460
On the Topology Optimization Design for the Stereolithography Based Investment Casting Model J.H. Zhu, W.H. Zhang and X.J. Gu	1464
Acquisition and Analysis for Customer Requirement Information Z. Xiao, Q. Liu and Q.S. Ai	1468
A Discrete Part Oriented Collaborative Manufacturing Service Platform Based on Agent and Grid Y.L. He, W.P. He and W. Zhang	1472
Determining Structural Modes of HSK Tool System Based on FEM and EMA C.G. Shen, G.C. Wang, S.L. Wang and G. Liu	1479
A Method for Problem Selection in the 6σ Definition Stage M.S. Yang, Y. Li, Y. Liu and X.Q. Gao	1485
An Apriori-Based Knowledge Mining Method for Product Configuration Design L. Yu and Y. Chen	1490
Tolerance Analysis for Compliant Assemblies with Thickness Deviation Y.F. Xing, Y.S. Wang and X.Y. Zhao	1494
Study on a Development Platform of Virtual Steam Jet Pump Based on Virtual Prototyping Technology D.B. Ren, X.K. Wang, J. Lei and J.M. Xiao	1498
Simulation Modeling Based on the Object-Oriented for Camshaft Production Line Z.H. Shu, H.J. Wang, Q.S. Han and T. Dong	1502
Simulation and Optimization of the Camshaft Production Line Based on Petri Net H.J. Wang, T. Dong, J. Zhang and H.Y. Wang	1506
A Study on Incremental Forming of Vertical Wall Square Box with Small Radius Corner L.R. Zhou	1510
The Effect of Forming Half-Apex Angle on Incremental Sheet Metal Forming L.R. Zhou	1514
Research on the Security of BPEL Based Manufacturing Service Workflow Management System W. Wang and L. Chen	1518
Case Retrieval for Product Configuration Based on NRS and KNN T. Xi, J.J. Li, L.J. Wang and M.H. Shi	1525
Branch and Bound Method with Heuristic Algorithm for a Special Flexible Flow Shop Scheduling Problem Z.T. Li, F. Hong, Q.X. Chen and N. Mao	1530
Conversion of Information Flow in Digital Manufacturing for Clothing Industry J.X. Qiu, Y.Q. Xu and M. Zhang	1535
Product Module Partition Method for Product Lifecycle Based on LSSVC L.J. Wang, T. Xi, Y.F. Zhou and R.H. Tan	1540
Study on Ontology-Based Knowledge Integration J. Hao, Y. Yan, G.X. Wang and J.J. Lin	1545

CHAPTER 14: Nano Fabrication and MEMS

A Method Study on Assembly of Single-Wall Carbon Nanotube Field Effect Transistor Using Dielectrophoresis K. Xu, C.D. Wu, X.J. Tian, Y. Zhang and Z.L. Dong	1550
Interface between Nanophotonics and Biotechnology: How the Near-Field Can Boost Proteomics Based on LSPR Nano Sensor X.X. Huang, Z. Cao, Y.L. Liu, Y.M. Dai, J.L. Zeng, R.H. Yang and H. Takei	1554
Nanoimprint Lithography: A Promising Candidate for Next-Generation Lithography X.Q. Fan	1558
Realization of Mass Production of Microlens Array by Hot Embossing on Silicon Substrate X.Q. Fan	1562
The Design and Testing of Mesopiezoresistive Effect Electromagnetic Driven Micromachined Gyroscope R.R. Wang, K. Du, Y.B. Shi and J. Liu	1566

Research on Multi-Domain Unified Modeling and Simulation of a Micro Electro-Thermal Actuator	
Y. Liu, F.T. Bao and H.F. Hu	1570
A MEMS-Based PDMS Micropump Utilizing Electromagnetic Actuation and Planar In-Contact Check Valves	
J.H. Ni, B.Z. Li and J.G. Yang	1574
Analysis of a Curved Beam MEMS Piezoelectric Vibration Energy Harvester	
Y. Zhou, Y. Dong and S. Li	1578
Design of MEMS High g Accelerometer and Study on the Overload Ability	
Y.B. Shi, P. Li and J. Liu	1582

CHAPTER 15: Mechatronics

Position Predictive Measurement Method for Time Grating CNC Rotary Table	
X.K. Liu, J.S. Yang, Z.H. Gao and D.L. Peng	1587
Study on the Engine Start/Stop Control Strategy of Hybrid Vehicles	
L.J. Zhao, R. He and G.J. Li	1591
Design and Analysis of Automatic Cutting Robot for Vertical-Pull Glass Pipe	
X.H. Sui, D.J. Miao and Z.M. Feng	1597
A System with Dynamic Reactive Power Compensating for High Power Windings Rotor Induction Motor	
H.R. Xiao, C. Min, J. Zhang and Y.J. Xiong	1601
Research on Drive Control Method of Scanning Mechanism of Radar Scatterometer Antenna	
S.X. Zhai	1605
Fuzzy Control of Non-Cable Type Autonomous Dredging Robot for Municipal Drainage Pipe	
F. Wang	1612
Application Research of FlexRay Communication Protocol in Engineering Vehicle	
Y.M. Bian, J. Jiang, X.M. Xu, L.J. Zhu, F.W. Zhao and B. Jin	1616
A New Energy Recycle Test Bench for Hydraulic Winches	
M.R. Li, Z.X. Chen and B.F. Xu	1620
Study Control System Based on Creep Test in High Density Baler	
W. Lee and C.G. Wang	1624
Research on Static Stiffness Characteristics of Parallel Machine Tool	
X. Jin and B.J. Yang	1628
A New Kind of Pumping Rod Appliance	
J. Luo, C.G. Sun, S.T. Wu, G.Y. Zhu and Y.B. Yuan	1632

CHAPTER 16: PDM, ERP, Logistics and Supply Chain

ERP Implementation Challenges in Small and Medium Enterprise: A Framework and Case Study	
S. Sahran, F.A. Goni and M. Mukhtar	1636
Benchmarking Implementation and Cluster Approach in Manufacturing SMEs: A Review	
M. Zeinalnzhad, S. Sahran and M. Mukhtar	1640
A Component Based Reconfigurable Scheduling System for Semiconductor Manufacturing	
Y. Wu, F. Qiao, L. Li and K. Ye	1644
Business Process Integration of Mold Making Enterprise Based on BPM	
M.Y. Huang, S. Hu and J.J. Li	1648
Analysis of Customization Cost Structural Model Based on Supply Chain	
Z.L. Wang, Y.X. Wang and Y. Lu	1654
A Key Parameters Analysis Method of the Quality Control in the Semiconductor Multiple Manufacturing Processes Based on Functional Data Analysis Method	
Y. Liu, Z.S. Zhang and J.F. Shi	1660
A Three-Fold Approach to Solve Dynamic Job Shop Scheduling Problems by Artificial Immune Algorithm	
S.S. Wu, B.Z. Li and J.G. Yang	1666

Commercial Recommended Services Research Based on ASP W. Zhang, X.H. Pan and L.L. Gao	1670
Information Management of Data Resources in Product Design and Manufacture Process Z. Li, L. Cheng, L.J. Yao and X.Y. Tong	1674
Solving Steel-Making and Continuous-Casting Scheduling Problem with Fuzzy Processing and Delivery Time Using Genetic Algorithm H.B. Wang, A.J. Xu and D.F. He	1679
Solving Flow Shop Scheduling Problem Considering Waiting Time Using Genetic Algorithm H.B. Wang, A.J. Xu, D.F. He and L. Yao	1684
The Advanced Production Planning of Automated Scheduling Problems in Irradiation Industry Z. Wang, G. Zhang and G.W. Zhao	1688

CHAPTER 17: Intelligent Controllers

Constraint Projection Adaptive Natural Gradient Online Algorithm for SVM Z.H. Sun	1692
Analysis of Heat Exchanger Performance Forecast Based on the BP Neural Network Y.M. Meng, H.F. Pang, Y. Jiang, Q. Zhou, T.T. Zheng and Q.L. Jin	1697
Friction Compensation Based Acceleration Feedback Control for Flight Simulator D.K. Shen, Z.H. Liu and S.Z. Liu	1702
Robust BackStepping Control Based DRNN for Flight Simulator D.K. Shen, J.J. Wang and Z.H. Liu	1708
Global Asymptotic Stability of Stochastic Fuzzy Cellular Neural Networks with Time-Varying Delays W.G. Luo, Y.H. Liu and H.L. Lan	1714
A Compression Algorithm for Vibration Signal of Rotating Machinery Based on Partitioned Iterated Function Systems J. Li, C.L. Zhang and X. Yue	1718
Study on Trajectory Planning and Control Method in Profile Cutting of Roadheader J. Mao, H.Y. Chen, M. Xie, J.G. Li and J. Wang	1723
A Study on Gray Relational Analysis of Many Factor Weights in Tobacco Leaves Classification P.J. Mao, L. Liu, J. Wang and C.Y. Hu	1728
A Novel Distributed Multi Agent System Plan Algorithm W.J. Jiang, X.M. Luo and L.N. Yao	1732
Design and Realization of the SMT Product Character Recognition System H.H. Zhao, D.J. Zhou and Z.H. Wu	1736
The Expert System of Prediction of Stroke for Precision Straightening Based on Database H. Lu, Q. He, H. Lin, Y. Wang, L.T. Zheng and W.W. Zhang	1740
Error Modeling and Compensation of Linear Motors Positioning Stage Based on RBF Network J. Lin and M.L. Wang	1744
The Electro-Hydraulic Proportional Control and Simulation of the Radial Piston Pump Based on Proportional-Integral-Derivative Neural Network L. Li, J. Ye and X.F. Zheng	1749
The Assemblability Evaluation of Automotive Glass Windshield Mold Based on Fuzzy Neural Network L. Teng, L.Z. Wang, D.H. Yu, S.L. Zang and Y. Jiao	1753
The Study and Design of UAV Dynamic Inversion Flight Control Law J.L. He, R.B. Jiang, B. Liu, X. Zhao and Q.H. He	1757
Reinforcement Learning Based Self-Constructing Fuzzy Neural Network Controller for AC Motor Drives Q. Wang, J.Y. Qin and J.H. Zhou	1763
Modeling of Piezoelectric Plate and Control Test J. Yao	1769

Application of Self-Adaptive Fuzzy PID Algorithm in the Control of the Oscillating-Plate Necking-In Machine Based on the Co-Simulation of DSHplus and Simulink Z.W. Zhang, F.C. Liu and Z.Y. Wu	1775
A New Genetic Algorithm Based on Optimal Solution Orientation Q. Wang, J.C. Liu, P. Wang and J.Y. Qin	1779
Rotor Speed Adaptive Identification of Direct Torque Control for Induction Motor Z.T. She, Y. Zheng and Y.J. Peng	1785
The Improvement of Real-Time Performance of 3-Tier C/S Using LAD Scheduling Algorithm in Middleware J. Ye and J. Li	1789
Intelligent Wheelchair System Based on Collaborative Kansei Engineering T. Zhou and Y. Yang	1793
The Study of Soccer Robot Path Planning Based on Grid-Based Potential Field Method Improvements X.J. Zhao, J. Bi, M.Z. Liu and L. Chen	1798
Study on Mathematical Modeling Method for Photoelectric Stable Platform Y.L. Bi	1803

CHAPTER 18: Industrial Automation and Process Control

Precision Construction in Japan - Utilization of Information and Communication Technology K. Tateyama and N. Omae	1807
Design of Frequency Control System for Centrifuge in Multi-Parameter Combined Environmental Testing Device Z.C. Rong, W. He and R.J. Shen	1817
The Modeling of Steam Turbine Speed Control System Based on Radial Basis Function Neural Network Y. Ren, T. Yang, W. Gao and Y.H. Li	1822
Modeling and Stability Analysis of Multi-Rate Networked Control Systems with Multiple Control Loops D.T. Liu, D.J. Zhou and Y.M. Liu	1827
Development and Application of Capacitor Compensation AC De-Icing Equipment J.Z. Lu, L. Yang, H.X. Zhang, Z. Fang and B. Li	1834
Design and Experimental Study of a Novel Fault Current Limiter C. Zhao, J.Z. Lu, Z.L. Jiang, Z. Fang and B. Li	1839
A Modified Quality Control Method for Manufacturing Process in Mask Industry W.F. Chiu, Y.T. Gu, M.A. Karim and L. Ma	1843
Online Learning Algorithm of Gaussian Process Based on Adaptive Natural Gradient for Regression Q.Q. Shen and Z.H. Sun	1847
High Speed Weld Control System of Dual-Bypass MIG Based on LabVIEW C. Xue, Y. Shi, D. Fan, H. Zhong and M.X. Shi	1852
The Working Mechanism and Control Method of GL160C Metal Belt CVT L. Zhang, X.M. Yang, T. Wei and Y.D. Shi	1856
Average Run Lengths in Shewhart Type Charts for 2-Order Autoregressive Process Q.X. Sun, J.L. Zhao and Q.S. Gao	1860
Prediction and Control for Profile Angle Error of Slotting Cutter of Herringbone Gear in Turbine Redactor B.W. Li, J.F. Xiao, C.L. Zhang and L.B. Hu	1864
Research and Development of the 5-Axis Shoe Last NC Machine X.G. Nie and Y.B. Liu	1869
Air Compressor Testing System Based on the HMI Software X.M. Zheng and J. Hu	1874
Research on PONC Calculation Method in Manufacturing Process Based on Working Procedure D.F. Xie, H. Wang, X.L. Fu and C.L. Liu	1879
Nonlinear Self-Adaptive Compensation of Screw down System of Tandem Cold Mill B.Q. Liu, Z.D. Wang, H. Zhang, J.S. Wang and Y. Zhang	1883

A Flatness Control System Design Based on Actuator Efficiency Factors for Cold Rolling Mill	
P.F. Wang, D.H. Zhang, X. Li and J.W. Liu	1889
Study on the Turret Feeding Servo System of Precision CNC Lathe	
J.C. Song and Y.M. Li	1894
Study on Process Control Method of Kiln Outlet in Cement Production	
J. Xiao, B. Liu and Y.X. He	1898
Simulation of Closed-Loop Control of the Landing Position of the Water Jet out from Water Fire Monitors	
Y.L. Min, X.Y. Chen, C. Chen and C.P. Hu	1902
Application of On-Line Detecting Harmful Substances in Flue Gas in Safety Assessment and Harmfulness Forecast	
Z.Q. Ye and X.Y. Yu	1906
Position and Attitude Control of Remote Ultrasonic Scanner Based on Sliding Mode Approach	
H.B. Yan and H. Ju	1910
Development of Sheet Material Stamping Automatic Feeding and Pick-Up Device	
Y.R. Li, Z.W. Niu and X.P. Sun	1915
The Cascade Three-Elements Fuzzy Auto-Adapted PID Control System for Boiler	
M.L. Wu, L.L. Wei, J.K. Huang and M.Y. Wu	1919
Application Study of Variable Parameters PID Dynamic Tension Control in Cold Rolling Mill	
Y. Zhang, F.Q. Shao, J.S. Wang and B.Q. Liu	1924
CVT Ratio Adjusting Process Control	
C. Wang and B.Y. Li	1929
Application of LQR Techniques to the Anti-Sway Controller of Overhead Crane	
B. Yang and B. Xiong	1933
Effect of Welding Sequence on Deposition Geometry Control in GMAW Remanufacturing	
S. Zhu, Y.Y. Liang and Q.W. Wang	1937
Study on Steady Condition Control of Hybrid Turbocharging System	
F.Z. Zhao, R. Liang and X.P. Chen	1941
Application of Single Neuron PID Control Based on Variable Scale Algorithm in Tar-Ammonia Separation	
T.P. Zhou and W.F. Huang	1945
Study on the Wood-Based Hydrogel and its pH-Sensitivity	
J.F. Duan and J.Z. Li	1950
A New Simulation System of Programmable Logic Controller	
Z.Y. Hu, H.W. He and Y.T. Duan	1954
The Application and Development of Automatic Tool Selection in Tool Magazine Based on PLC	
C.Q. Deng and B. Li	1959

CHAPTER 19: Virtual Instrumentation in Automation

Research on Weak Signal Amplification Principle Based on Parabola Map	
Z.Q. Huang, W.L. Zhao and Z.G. Wang	1963
The Design of the Measuring and Controlling System of the High Power Pump Performance Test-Bed Based on Virtual Instrument Technique	
S.M. Chen and W. Zhang	1967
Modeling of Test Resource Based on Multi-Agent and its Application in Intelligent Virtual Instrument	
X.Y. Tian, T.Q. Chang, S.H. Shi, L. Zhang and Y. Han	1973

CHAPTER 20: Advanced Measurement and Machine Vision System

Study on the Technologies of Rapid Three-Dimension Optical Measurement for Spatial Tubular Joints Deformation	
B.Q. Shi, J. Liang, Q. Liu, X.Q. Zhang and Z.Z. Xiao	1977
3-D Shape Measurement Based on Optic Interferometric Projection	
J.H. Gan, L.P. Zhou, L.Z. Chen and L. Xu	1981

Modeling and Analysis for Sound Field of Rectangular Small Enclosure under the Excitation of Panel Loudspeaker by Using FEM B. Fang, R.J. Shen, J.F. Guo, W. He and M. Ma	1985
Characteristic Recognition of IC Chip's Micro-Topography Defects Based on Image Projection Transformation and Energy Optimization Modeling Z.W. Liang, C.L. Zhang, Y.J. Wang and Z.M. Xiao	1990
Positioning of Characteristic Points in IC Chip's Micro-Topography Based on Cross Correlation Matching and Image Projection Transformation Z.W. Liang, C.L. Zhang, Y.J. Wang and Y.D. Hu	1996
Research on Crack Generating in the Process of Hybrid Plasma and Laser Deposition Manufacturing Y.P. Qian, X.W. Zhang, X.Z. Zhou and H.O. Zhang	2002
A Gait Recognition Algorithm Based on Wavelet Moment and Double Triangle Feature X.K. Zhu, F. Zhang, R. Li and Y.B. Cui	2006
A New Grating Non-Diffracting Structured Light for Three Dimensional Shape Measurement L.Z. Chen, D. Qu, L.P. Zhou and J.H. Gan	2010
Research on the Splitting Measurement Method of Space Position in Three-Dimensional Field D.X. Wang, Q. Li, F.B. Li and Z.K. Li	2015
Research on Image Segmentation Technique for Pebrine in Silkworm Based on HSI Model D.D. Zhang, X.Y. Hu, Y.R. Pan and G.Y. Yang	2019
Application Research of Face Feature Extraction Based on DM642 J.Q. Liu, Q.Z. Fan and D. Cao	2024
Traditional Chinese Medicine Pulse-Condition Simulation and Wavelet Recognition Method D. Cao, J.W. Ye, J. Yi, W.J. Ruan and C. Chen	2029
A New Flatness Evaluation-Rotation Method Based on GA Y.M. Jiang and G.X. Liu	2033
Design of Poultry Meat Edible Quality Detection Device Using Multiple Image Sensors J.H. Zhao, M.H. Liu, C.H. Zhan, J. Shen and D.C. Tu	2038
Low-Cost Optical Measurement for Micro-Displacement with High Accuracy Q.H. Lu, X.M. Zhang and Y.B. Fan	2042
Stereo Matching Algorithm Based on Phase Dynamic Programming in 3D Profile Measurement X.H. Liu, K.Y. Jiang and J.Y. Lin	2046
Skeleton-Based Feature Extraction Method for Two-Dimensional Potential Energy X.S. Chen, C. Wang, X.J. Xu, H.B. Zhu and S.H. Jiang	2051
The Study of the Relationship between the Helix and the Individual Error in Gear Hob Measurements X.L. Fan and N. Deng	2055
Visual Technique for Detecting Weld Position Based on Hough Transformation Z.Y. Li, X.D. Gao, X.H. Zhu and J.W. Lin	2059
Uncertainty Estimation in Straightness Mini-Zone Verification Based on Improved GPS Standard System H.Q. Du and Y. Zhang	2063
Machine Vision System for Inspecting Surgical Blades S.Y. Wang, J. Tan, X.C. Yin and H.F. Wang	2067
A Novel Method of Wire Detection Combined PCNN with HT G. Han, M. Zhang, Y.C. Zhong and L.X. Wei	2072
A Fast and Precise Measuring Method for Large Workpiece Based on Machine Vision H. Zhou and J.G. Yang	2076
Application of Machine Vision Technique in Plate Camber Control System C.Y. He, Z.J. Jiao and D. Wu	2082
Measurement Method for the Symmetry Error of Double Keyway in a Wheel Hub Bore X.M. Zhao and Y. Feng	2087
Research of Welding Deformation Measurement Based on Visual Method J.K. Huang, L.H. Lu, X.L. Wu, Y. Shi and D. Fan	2093

Design of Remote Calibration System Oriented to Multiple Objects and Complex Requirements	
Z.K. Wu, G.X. Liu and X.B. Hong	2097
Comparative Research on Contact and Non-Contact Measuring Methods of 3D Twisted Blades in a Torque Converter	
Q.D. Yan, C. Liu and W. Wei	2102
A Novel Method of Sub-Pixel Linear Edge Detection Based on First Derivative Approach	
X.C. Shi, Z.Z. Sun and S.L. Lu	2107
Application of Image Processing in Quality Detection of PS Plate	
Y.J. Li, J.X. Pu and Q.H. Zhang	2112
Research on Adaptive Denoising Method for Surface Roughness Measuring	
X.B. Pan, X.J. Zhou and Z.S. You	2117

CHAPTER 21: Industrial Robots and Automation

The Research and Simulation of Trajectory Generation Method for Tractor-Trailer Mobile Robot	
Q. Zhang, Y. Li and Y. Kamiya	2121
Matlab-Based Embedded Controller Design for Robot	
Y. Ning and J.F. Zhao	2126
A New Blind Source Separation Algorithm in Application of Over-Determined Mode under Lower SNR	
P. Wang, J. Chen and J.X. Lu	2132
Integrated CAD Software with ERP Interface for Steel Portal Frames	
S.R. Liu, H.Z. Yang, Z.G. Chang and Q.L. Zhang	2136
Servomotor Parameter Estimation of a 2-DOF Translations and Full Rotation Parallel Mechanism	
Y.B. Ni, X.Y. Zhong, L. Guo and F.Y. Luo	2140
Study of Dry Wire Electrical Discharge Grinding	
Y.P. Qian, J.H. Huang, X.Z. Zhou and M. Kunieda	2146
A Multi-Sensory Robot Used for Searching Toxic Gas Leak Source	
X.J. Zhang, M.L. Zhang, J.H. Zhang and L.Y. Sun	2150
An Improved Spectral Subtraction Algorithm Study Based on Voice Human-Computer Interaction in Cockpit	
J.X. Lu, P. Wang and L. Yi	2154
Overall Design of High Pressure Isolation Plug Train	
C. Zhang, S.M. Zhang, H.L. Zhao, X.Y. Xu and D. Geng	2158
A Robot Calibration Method Based on Virtual Closed Kinematic Chain	
T.Q. Wang, C. Liu, Z.P. Zhang and D.C. Wang	2162
A Four Degrees of Freedom Parallel Manipulator for Machining	
W.J. Chen, Y.Z. He and J. Zhang	2168
Vibration Analysis of New Type Pipeline-Cleaning Robot	
Q.Z. He, W.C. Zhao, J. Wang, Y.L. Zhang and M.C. Wang	2172
New Plane/Space Thermal Cutting Robot Workstation System	
X.B. Kong, Y. Cui and Y. Yao	2178
Research on the System for Coal Mine Disasters Prevention Based on Modularization Heterogeneous Multi-Robot	
H. Wang, R.Q. Jia and H.X. Zhu	2183
The Trajectory Optimization of Spray Painting Robot for Conical Surface	
Y. Zeng and J. Gong	2189
The Pig Tracking System Based on AVR Microcontroller and GPS/GSM	
H.J. Wang, S.M. Zhang, P. Zhang and L.Y. Shi	2195
Research on Machine Vision in Forestry Pluck System	
X. Li, C.L. Zhang, L.J. Li and Z. Hu	2199
Research on 2-Dof Parallel Robot and its Motion Characteristics	
H.P. Shen, L. Ding, C.Y. Xue, J. Li, J.M. Deng and S.S. Liu	2203

CHAPTER 22: Distributed Control System

Research on Multi-Parameter Measure and Control Technology Based on Wireless Communication in Combined Environment Testing	
Y.L. Zhou, W. He, R.J. Shen and M. Liu	2207
Realization of WSN Location Monitoring Terminal System Operation Strategy	
G.X. Liu, Y.W. Huang and X.B. Hong	2212
Implementation of CANopen Distributed Control Network Based on ARM in Automatic Production Line	
J. Zhang, B.B. Chen and X.J. Zou	2217
De-Synchronization of the Distributed Refrigeration System	
L. Chen and R. Wisniewski	2221
Study on Sample Rate and Performance of a Networked Control System by Simulation	
M.L. Si, H.X. Li, X.F. Chen and G.H. Wang	2225

CHAPTER 23: Embedded System

Design of a New Frequency Converting Electromagnetic Water Treatment Control System	
X.K. Liu, J.H. Rao and D.M. Zhou	2229
Design of Embedded Numerical Control Platform for Carton Samplmaker	
J.Q. Liu, J.R. Wu and D. Xu	2234
The Application of Embedding Operating System at the High-Precision Temperature Calibration Device	
J.Y. Li, M.M. Zhang and H.D. Huang	2239
Design of Pure Electric Vehicles' Drive Motor Controller Based on dsPIC	
C.Q. Li, X. Sun and X.L. Dong	2243
Method of Judging the Energy Measurement Device Error Wiring Based on Checking Tables	
X.Z. Zhang	2247
A Monitoring System for Residential Quarter Security Based on Wireless Sensor Network	
W. Li, Z.W. Liu and J.P. Xu	2252

CHAPTER 24: Sensors for Automation

Optimization Design of a Piezoelectric Transduction Silicon Resonant Pressure Sensor	
S.S. Nay, S.C. Fan and Z.S. Guo	2256
Fabrication of Ethanol Sensor Based on a Calixarene Derivative Coated Piezoelectric Quartz Crystal	
Y.L. Dai, Z. Cao, Y.M. Dai, J.L. Zeng, W.G. Huang, J.L. Hu, D.L. He and K. Aoki	2262
Attitude Estimation Algorithm of Optronics Mast Systems (OMS) Based on Fuzzy Weighted Method	
X.Y. Zhou, Z.Y. Zhang, L.C. Zhang and D.P. Fan	2266
Structural Optimization for Direct-Decoupling Planar Capacitive Sensor	
X.X. Li, W. Wang and J.P. Yu	2271
Design of Embedded Greenhouse Monitoring & Control System Based on WSN	
N.N. Qin, D. Li, F. Xu and B.G. Xu	2275
A Kind of Linear Array CCD Drive Frequency Regulation Technology	
H. Lu, L.Y. Tan, B. Lei, L.S. Jian, Y. Wang, F.D. Du and Q. He	2279
Development and Fabrication of the Micro Eddy Current Sensor by Using UV-LIGA Process	
X.H. Zheng and F. Gu	2283
The Research of the Ultrasonic Heat Meter Adopting a Through Structure	
S.L. Nie, T. Sugi and B. Liao	2287
Development of Cylinder with Multiple Diagonal Slits for Ultrasonic Longitudinal - Torsional Vibration Turn-Milling	
Y.D. Zhang and B. Zhang	2291
Research on Metro Vehicle Vibration with Regard to Route Conditions	
H.C. Zhang, X.D. Zhang and G.Z. Cao	2295
Design of DSP Video Image Processing System Control Software	
H.Y. Wen	2299

Modal Analysis of a Six-Axis Accelerometer C.G. Li, Y.P. You and J.J. You	2303
 CHAPTER 25: Vibration System and Analysis (Random Vibration, Flow Induced Vibration)	
Vibration Localization Analysis of Bladed Disk with Grouped Blades A.L. Wang, B.H. Sun and J.B. Chen	2307
Dynamic Propagation of Mode III: Crack Concerning Surfaces Subjected to Variable Moving Concentrated Loads C. Jin, Y. Ba, M. Lin and B.K. Guo	2312
Study on Effect of Surface Friction on the Dynamic Behaviours of Cylindrical Gear Transmission J.Y. Tang, Q.B. Wang and C.W. Luo	2316
Harmonic Response Analyses of Three Knife-Shape-Tooth Star-Wheel Loading Mechanism X.H. Li, Y.D. Sha, J.Q. Yao and C.H. Liu	2322
Analysis and Comparison of Contact Forces between the Constrained Tongs and the Under-Constrained Tongs Q.M. Li, Q.H. Qin and H. Deng	2326
Vibration Analysis of Composite Plate Embedded with SMA Fibers Z.L. Wang, X.Y. Chen, E.Y. Jiang, D.S. Huang and X.J. Zhu	2331
Research of Adaptive Vibration Control with Piezoelectric Materials L. Zhang, D.W. Li and Z.J. Mao	2336
Analysis of Piezoelectric Power Harvesting with Composite Energy Converter in Thermal Environments S. Wen, T.M. Zhang and X.L. Yang	2340
Dynamic Analysis of the Sucker-Rod Pumping System of Deviated Well Based on LuGre Friction Model B.X. Liu and H.Z. Liu	2346
Effect of Contact Interface on Ultrasonic Characteristic of Wire Bond Transducer Z.H. Li, Y.X. Wu and Z.L. Long	2350
Research on Fault Diagnosis of Ship Stern Bearing Based on Vibration Analysis Y. Jin and L.L. Zheng	2354
Modal Test and Finite Element Analysis of Sand Blender's Agitator J. Hua, S.Z. Zhou, J.Q. Wang, F.P. Zhong and X.X. Wei	2359
Modal Analysis of Ring-Plate of Double Crank Four Ring-Plate-Type Cycloid Reducer B. Yang, W. Liu and Y. Liu	2364
Research on the Vibration of Drilling Derrick T. Yan and C.J. Han	2368
Dynamic Analysis of Grinding Wheel Mechanism on Large Vertical Glass Edging Machine H.H. Xu, X.Y. Li and D. Liu	2372
Study on the Influence of the Damping to Nonlinear Vibration Caused by Pair Clearance Y.C. Yuan, Y. Li and Y.M. Wang	2376
Subharmonic Resonance Analysis of a 2-DOF Controllable Linkage Mechanism System Affected by Self-Excited Inertial Force R.G. Wang, Y. Chen and G.W. Cai	2381
Numerical Simulation of a Self-Decoupling Magneto-Rheological Damper on Electromagnetic-Thermal Coupling G.J. Yu, C.B. Du and F.X. Wan	2386
The Dynamics Analysis of Metamorphic Mechanisms Based on Fully Cartesian Coordinates Method B.Y. Chang, G.G. Jin, J.S. Dai and J.T. Yun	2391
The Study on Harmonic Vibration of Drill String in Horizontal Well C.J. Han and T. Yan	2397
A Two-Stage Optimization Approach for Structural Dynamic Design of Mechanical Systems X.R. Qin, J.J. Shen, J.J. Zhang, Y.F. Li and Q. Zhang	2401

Dynamic Response of a New Railway Emergency Steel Truss Girder under the Moving Train Loads	
Y.H. Zhang and H.L. Wang	2405
Research on the Impact of AGC Vibration on the Horizontal Vibration of the Roll System for CSP Rolling Mill	
X.Q. Yan, M. Bao, G.H. Zhu and Z.H. Song	2409
Dynamic Characteristics of Planetary Gearbox of Shield Tunnelling Machine	
Z.M. Xiao and D.T. Qin	2413
Optimum Design of Compound-Axis Servo System	
W.D. Zhan, H.Z. Li and Z.J. Wang	2418
Dynamic Simulation and Experimental Modal Analysis of Large Vibratory Feeder	
L.W. Zhang, Z.J. Yin, B. Chen, Z.C. Tang and Z. Tian	2423
Dynamics Analysis for Periodically Forced Oscillation System	
N. Lu and J. Mao	2427
Fracture Cause Analysis and Improvement on Waveguide Tube of Satellite Calibration Antenna in Random Vibration	
W.J. Fan	2431
Dynamic Reliability Evaluation of Pressure Pulsation for Hydraulic Power Pipelines	
W. Liu, H.S. Gao and Z.F. Yue	2436
A Method of Dynamic Modeling of a Large Floating Crane and its External Excitations	
Q. Zhang, J.J. Zhang, J. He, Y.F. Li and X.R. Qin	2440

CHAPTER 26: Vibration Measurements and Controls

Experimental and FEM Modal Analysis of Workbench for PCB Drilling Machine	
H.Q. Tang, C.Y. Wang, B. Wang, L.X. Huang, S.S. Hu and Z.S. Chen	2446
Vibration Analysis and Control in Amorphous Alloy Dry-Type Transformer Core	
X.H. Yao and X.Q. Zhang	2452
Supports' Dynamical Optimized Design for the External Pipeline of Aircraft Engine	
H.B. Zhai, B.H. Li, Z.F. Jiang and Z.F. Yue	2456
Research on Output Characteristics of Piezoelectric Accelerometers for Low-Frequency Vibration	
C.F. Zhu, X. Qin and L.W. Zheng	2460
Study on Vibration Signal Marginal Spectrum of Paper-Transferring System in Printing Press Based on EMD	
Y.M. Wang, S.H. Zhang, Z.H. Zhang and J. Li	2464
Study on Effect of Rotor Vibration on Tip Clearance Variation and Fast Active Control of Tip Clearance	
B.H. Jia and X.D. Zhang	2469
Testing and Error Analysis of some Structure's Impact Load	
J.P. Wu and Y.X. Cai	2473
Study on the Application of Metal Rubber Isolator in Compressor Base	
H.L. Fu, L.Q. Zou, G. Dai and X. Chi	2478
Fast Steady Horizon Sensor Based on Filtering Vibration	
L.Y. Zhang and Y.L. Ran	2482
An Experimental Study on Selection Method of Vari-Speed Milling Parameters	
X.Q. Xue, N. He, L. Li, W. Zhao and Q. Wang	2486
Active Vibration Suppression Control Algorithm in Gyroscopic System	
Z.H. Zhang and S.A.Q. Siddiqui	2490
Performance Analysis of Large Radial Equal-Thickness Vibratory Feeder	
Z.C. Tang, Z.J. Yin, B. Chen, L.W. Zhang and L. Jin	2494

CHAPTER 27: Condition Monitoring and Fault Diagnosis

Analysis of Flexural and Torsional Vibration for Turbogenerator Shafts on Power Impact	
L. Xiang and S.X. Yang	2498
Feature Analysis of Mechanical Fault Signals Based on the Wavelet Transform Technique	
B.C. Wang and Z.H. Ren	2502

Fault Diagnosis of Rotating Machinery Based on FDR Feature Selection Algorithm and SVM	
S. Li, C.L. Zhang and X. Yue	2506
Study of Concrete Pump Truck Structural Health Monitoring	
G.J. Hua, Y.X. Wu and S. Wang	2513
Inner Leakage Fault Diagnosis of Hydraulic Cylinder Using Wavelet Energy	
H.B. Tang, Y.X. Wu and C.X. Ma	2517
Tool Condition Monitoring Based on Radial Basis Probabilistic Neural Networks and Improved Genetic Algorithm	
D.W. Li, H.L. Gao, Y. Shou, P. Du and M.H. Xu	2522
Study on Screw Pairs Life Prediction Based on Hidden Markov Model and Neural Networks	
H.L. Gao, S.T. Yu, D.W. Li, X.X. Wu and M.H. Xu	2527
Fault Diagnosis of Nuclear Power Equipment Based on HMM-SVM and Database Development	
H.Y. Zhu, C.L. Zhang and X. Yue	2532
Dynamic Interpretation Method of XML Configuration Strategy for IP Mode Measurement and Control System	
X.B. Hong, G.X. Liu and J.L. Xu	2537
Investigation on the Modeling of Rotor Axial Displacement Fault Diagnosis and Prognosis for Centrifugal Compressor	
W.M. Wang, Z.Q. Xin and W.Z. An	2542
Study of On-Line Condition Monitoring System for Roller Based on HMM	
Y.H. Tang, G.X. Lin and C.L. Zhang	2546
Research and Application on Chlorophyll Fluorescence On-Line Monitoring Technology	
J.W. Ji, M.H. Xu and Z.M. Li	2550
De-Noising of Damage Signal in Wire Rope Based on Adaptive Lifting Wavelet	
W.X. Zhan, J.W. Tan and Y. Wen	2556
Steam Turbine Blade MMM Testing and Failure Analysis	
H.Y. Xing, D.B. Wu, L.H. Zhang and M.Q. Xu	2561
The Remote Monitor for Smart Motion Device by Using VPN Technology	
X.J. Wu, S.D. Sun and J.W. Zhang	2565
Rolling Bearing Fault Diagnosis Based on AIS	
Y.B. Hu, X. Yue and C.L. Zhang	2569
Curvature Mode Characteristics of the Simple Beam with a Local Damaged Crack	
Y. Tie, P. Xu and J.Y. Chen	2574
One Method to Determine the Optimal Maintenance Time Based on Selective Attrition	
J. Liu, H.P. Ji and Q.X. Zhu	2578
A Method of Simulating Computation for the Fatigue Life Prediction	
W.L. Zhao and D.G. Liu	2582
Engineering Machinery Engine System Reliability Analysis	
X.N. Zhang, A.X. Liu, Q.Z. Gao, X. Qing and X. Chang	2587
Study on the Method of Multi-Rope Hoist Rope Tension Imbalance Fault Monitoring and Diagnosis	
S.J. Wang, Z.J. Yang and F. Du	2591
Monitoring of Drilling Tool Condition through Spindle Current	
Y.H. Ao	2595
Supervised Locally Linear Embedding for Fault Diagnosis	
Z.W. Li, R. Nie and Y.F. Han	2599
Research on Rotating Machinery Vibration Fault Based on Support Vector Machine	
C. Zhang and D.Q. Liu	2603
Visualization Design Technology of Hydraulic System in the Fault Diagnosis Research and Application	
G.H. Fang, X.S. Li and J.F. Liu	2608
The Study on Piezoelectric Impedance Technique Used in Loading Damage Identification	
J. Zhang and Z.J. Qin	2612
Fault Diagnosis for Stiction of Pneumatic Control Valve	
X.J. Zong, Z.J. Yang and H.Y. Zheng	2616

CHAPTER 28: Vehicle Dynamics

A New Method for Estimating Road Friction Coefficient F. Lin	2622
Study on Integration Control of Air Suspension and ABS S.R. Yan and S.J. Lu	2626
Feasibility Study on Active Control of Hydraulic Electromagnetic Energy-Regenerative Absorber L. Xu, X.X. Guo and J. Yan	2631
Evaluation of Energy-Regenerative Suspension Structure Based on Fuzzy Comprehensive Judgment (FCJ) L. Xu, X.X. Guo and J. Liu	2636
Modeling and Simulation of Motorcycle Ride Comfort Based on Bump Road D.M. Yuan, X.M. Zheng and Y. Yang	2643
Study on Impacting Characteristics of a Metro Vehicle S.H. Zhang and M.W. Wan	2648
Dynamic Study on Vehicle Hydro-Pneumatic Suspension L.X. Geng, L.J. Zhang and R.Z. Wu	2653
The Dynamics Simulation of Braking Process on Automobile Disc Brake C.Q. Fu, Z. Wang, B. Li and C. Yu	2658

CHAPTER 29: Rotor Dynamics

Effect of Manufacturing Tolerances on Stiffness and Damping of Hydrodynamic Journal Bearings W.B. Xu, P.J. Ogrodnik, M.J. Goodwin and G. Bancroft	2662
Stability Margin of Quasi-Periodic Motion in Nonlinear Rotor System: Experimental Validation H.P. Zheng	2668
Study on Dynamic Model and Characteristic of Internal Parallel Moving Gears Transmission F. Wen, G.W. Cai, Y. Ni and H.X. Zhang	2672
Simulation of Crack Dynamic Characteristics of Rotor Based on FEM Analysis K. Yang and Y. Yang	2677
Numerical Analysis of Agitated Flow Field of Submersible Mixer W.X. Xu and S.Q. Yuan	2681

CHAPTER 30: Other Related Topics

Strategy Research on Rapid Design of Complex Product Based on Case Reuse Technology Y.L. He, S.P. Li, D.H. Fan, H.L. Nong and Y. Luo	2685
Test Analysis of Friction Moment between Ball and Cage of Miniature Bearing at Very Low Speed S.N. Jiang, X.Y. Chen, J.M. Gu and S.S. Li	2691
Desert Road Hypothesis: No Subgrade Kevlar Fiber Surface Road X.Z. Wang and G.X. Wei	2696
The Candidate Enterprise Selection on Extended Evaluation Theory L.Z. Chen, L.S. Gao and C.Y. Jia	2700
A New Method for Inspecting Crack of Concrete Bridges Using Image Processing Technique M.C. E, G.Q. Zhang and J.W. Wang	2704
Frictional Characteristics of Tool and Material in Turning Particulate Reinforced Iron-Based Composites L.F. Han, S.G. Qu, S.Y. Zhong and C.X. Xie	2709
The Stability Control to the Mechanical Properties of High-Pressure Gas Cylinder Industrial Production by Using Stability Indicators S.Y. Jin, Z.G. Huang, H.L. Dong, Q.H. Yuan, J. Fan and C.S. Wu	2713
Design and Test on a New Pattern Friction Damper W.H. Wei and K. Chen	2720

