

# Table of Contents

## Preface and Organizing Committee

## Chapter 1: Digital Manufacturing and Advanced Manufacturing

<b>A Fuzzy Case-Based Reasoning Model to Forecast Prices of Aquatic Products</b> R. Maharjan and H.C. Yuan	3
<b>A New Kind of Optimization Method for Gear Design</b> Y.G. Wu	7
<b>AMESim Based Numerical Analysis for Electrohydraulic Exciter Applied on New Tamper</b> D. Han, G.F. Gong and Y. Liu	11
<b>An Optimized Algorithm for Discretization of Cutter Location Points on the Laser Cutting Path of Three-Dimensional Surface</b> J. Hu, F. Deng and X.C. Qiu	19
<b>An Ultrasonic Knife System for MEMS Packaging</b> J. Sha, Z.Y. Yao and Y. Jiao	23
<b>Application of SLP Method in Design of Facilities Layout in Workshop</b> Z.R. Li, L. Qin and Z.Q. Cao	28
<b>Based 3D Process Production Site Visualization Manufacturing Technology Research</b> B.R. Du, X.L. Wang and B. Meng	33
<b>Based on Energy Loss Analysis Theory to Analysis Operation Parameter and Coal Consumption of 300MW Power Plant</b> K.R. Liu and J.B. Yang	37
<b>CFD Analysis of Elementary-Kinetic Chemical Reactions and Effects on Transport Processes in Anodes of Solid Oxide Fuel Cells</b> C. Yang, G.G. Yang, D.T. Yue and J.L. Yuan	43
<b>Change Order Audit in Machinery Enterprise Base on the Delivery Schedule and Loss Cost Estimate</b> J.Q. Chen	53
<b>Characteristic Analysis of Francis-Turbine in Cooling Tower</b> L.J. Zhang, L. Wang and Y. Ren	57
<b>Cloud Manufacturing-Based Enterprise Platform Architecture and Implementation</b> F. Zhang and H.F. Xue	60
<b>Cultivation Management and Standard Library Automatic Query System of Digital Greenhouse</b> J. Sun, G.Q. Zhang, Z. Chen, L. Gao and J.M. Li	64
<b>Design and Realization of Scald Device in Automatic Confecting Machine of Rice Noodles</b> J. Li	70
<b>Design Knowledge Reuse Strategies for Complex Equipment Design</b> D.M. Zhang, Y.Y. Wu and Y. Huang	74
<b>Development Practice of LCR Automatic Test System Based on Agilent E4980A</b> M.T. Yang, C.R. Zhu, H.W. Jin, W. Cai and X.M. Wang	78
<b>Endogenous Growth Model for China's Green IT Based on Green Technology and Green Society</b> F.T. Liu	83
<b>Fault Diagnosis to Mid-Size Excavator Bucket Hydraulic System Based on Fault Tree Analysis</b> J.H. Sun, C. Ma and Y.L. Yi	88
<b>High Speed Dry Cutting Technology Applications in Production</b> Y.C. Li, Y.H. Zhang and B. Sun	93
<b>Identification of Dynamic Model for Ultra-Precision Positioning System</b> H. Chen, X.P. Zhou, Y.H. Tan, R.Q. Li, Y.H. Zhang and R.L. Dong	97
<b>Knowledge Representation for Process Planning of Mechanical Parts Based on Ontology</b> W.B. Zhu, X.K. Lin, L. Chen and Y. Gan	101

<b>Method Research and Practice for Numerical Simulation Analysis of Temperature Field of Hot Runner of Injection Mould</b> F. Chen	106
<b>Modeling and Performance Analysis for Cluster Tools Based on SPN</b> X.H. Zheng	111
<b>Numerical and Experimental Investigations on the Expansion Tube Energy Absorber</b> H. Mao, C.J. Luo, K. He and R. Du	115
<b>Numerical Investigation of Fine Blanking of a Helical Gear</b> S. Yang, L. Hua and Y.L. Song	121
<b>On Anti-Noise-Algorithm of Optical-Polarization-Sensing Localization</b> G.X. Guan, Y.Z. Han, M.H. Wu and J.G. Han	126
<b>Optimization of Valve Block Shape Using CFD</b> Q. Yang, X.Z. Wang, M.Y. Liu, J. Hu and Z.G. Zhang	133
<b>OSG-Based Modeling of the Flexural Deformation of the Crane's Main Arm</b> Q.W. Deng, Z.W. Wu, Q. Fan and Y.R. Hu	139
<b>Practically Optimal Point and its Solution in Deterministic System</b> R.P. Li, X.Y. Kong, L.Q. Gao and D.X. Zou	143
<b>Predictive Modeling of the Performance of the Hydrocyclone with Different Cone Combination</b> F.Q. He, H.L. Wang, Y.H. Tan, J.G. Wang, P. Zhou and C.K. Seong	147
<b>Research on Production Quality Control and Efficiency Measurement Based on DEA-Benchmark Model</b> Y.S. Yang, C.Q. Guo, Y. Cheng and J. Yang	151
<b>Research on Production Scheduling Method and the Application in Switch Machine Production Enterprise</b> J.Q. Chen	156
<b>Revenue-Sharing Contract of Three-Level Supply Chain under Disruption</b> Q.H. Pang, H. Jiang and T.T. Lu	160
<b>Rough Set of Optimized Probabilistic Neural Network in Identification of Blue and White Ceramic from Jingdezhen</b> H. Wang, H.Y. Liang and B.X. Liu	164
<b>Serial-Communication between PLC and Host Computer in Spatial Carport</b> S.L. Dong, F. Wang and J.L. Yu	168
<b>Simulation Analysis of Parallel Cluster Tools in Semiconductor Manufacturing</b> X.H. Zheng and K.F. Zhang	173
<b>Simulation and Analysis of the Model of Calculating Contact Tangential Stiffness between Cylinders' Joint Interfaces by MATLAB</b> Q. Chen, K. Huang, H. Zhao and Y. Zhang	177
<b>Simulation and Modeling Method for Micro Turn-Milling Cutting Process</b> Z.W. Zhao, X. Jin, Z.J. Zhang, X.Y. Sun and Y.J. Deng	182
<b>Study on Welding Process of Clutch Wheel-Hub Weldment Using Vacuum Electron Beam Welding</b> D.Q. Wang	187
<b>The Application of BP Neural Network to Comprehensive Assessment in Equipment Maintenance Support</b> J.J. Wu, B.N. Cao, Z.J. Wan and J.L. Zhang	191
<b>The Construction of Security Supervision Platform for Fireworks and Firecrackers Based on IOT</b> B. Jia, Y.J. Yang and C.S. Cui	195
<b>The Designment of Digital Greenhouse Expert System</b> J. Sun, F. Zhang and Z. Chen	199
<b>The Research of System Security Based on .NET Platform</b> J. Zhou	205
<b>The Solution of the Dynamics Prediction of Aircraft State</b> X.Y. Zhao, J.C. Quan, J.Y. Wei, Y. Liu and K.X. Chen	209
<b>The TCA of Hypoid Gears Based on MATLAB</b> M.X. Xiao and H.R. Yan	213

<b>The Uncertain Programming of the Closed-Loop Supply Chain with Remanufacturing System</b>	
Y.J. Chen, D.B. Liu, H.W. Mao and Z.Q. Zhang	218
<b>Three Dimensional Numerical Analysis of Plasma Spraying Using Supersonic Plasma Gun</b>	
F.S. Hu, Z.Y. Wei, B.L. Liu, J. Du, C. Tan and Z.H. Han	222
<b>Using Contextual Words for Object Detection</b>	
J. Guo and C.R. Zhu	227
<b>Virtual Prototype and Modal Analysis of Stator System of Large Turbo-Generator</b>	
Y.X. Wang, Y. Wang and L. Lin	232
<b>Web Roaming of 3D Taiwan Island Based on Skyline Prototype System</b>	
J.W. Wu, J.C. Quan, X.Y. Zhao, Y. Liu and H.W. Wang	237
<b>A New Approach to Battery Capacity Prediction Based on Hybrid ARMA and ANN Model</b>	
H.C. Dong, S.T. Zhang, Q.H. Li and C.H. Wang	241
<b>Finite-Element Analyze of D-Post on Numeric Controlled Gear Hobbing Cooperative Working Machine Based on ANSYS</b>	
S.Z. Zheng, G.L. Zhang, C.X. Zhang and Y. Zhao	245
<b>Study of Development IETM Based on S1000D Specification</b>	
Z.J. Wan	249
<b>The Effect of Temperature and Solvent Concentration on the Nanomotor Motion by Molecular Dynamics Simulation</b>	
G.Y. Zhang, Q. Sun, L.Q. Li and L. Wang	253
<b>The Relative Efficiencies of the Aggregated Improved Generalized Ridge Estimators of the Parameters in the Linear Model</b>	
Y.Z. Zhou and W.T. Lv	257
<b>Ant Colony Clustering Algorithm for Handwritten Arabic Numeral Recognition</b>	
K.H. Hu, B.X. Liu and Y.J. Zhang	261
<b>Application of Hard C-Means and Fuzzy C-Means in Data Fusion</b>	
A.H. Tang, L. Cai and Y.M. Zhang	265
<b>Design and Implementation about Virtual Experiment for Lift Coefficient Mensuration</b>	
L. Ming, S. Li, J.X. Yin, T.Y. Hu, Z.K. Wang and P. He	269
<b>Design of Virtual Store Roaming System Based on Virtools</b>	
G.Q. Shen and J.J. Xu	273
<b>Determination of Parameters in Compound Fill Sphere Model for Haptic Interaction</b>	
Y. Liu, Y.C. Zhang and W.S. Chou	277
<b>Model of Customer Loss Based on Cluster and Neural Network</b>	
Y. Wu, B.X. Liu and M.S. Li	284
<b>Modelica-Based Simulation of Fuzzy Temperature Control System in Virtual Experiment</b>	
J.F. Lu, L.H. Xiao and R. Su	288
<b>Parameter Identification Research Based on ARX Model</b>	
H.Y. Liu, J.H. He and S. Chen	292
<b>Research on Completeness in Decomposition and Composition of Petri Nets</b>	
C.L. Hou, Z. Ma and X.Z. Qi	297
<b>Research on Construction of the Military Geographic Information System Based on Web Services Technology</b>	
H.W. Wang, G. Yang, H.N. Wu, Y.W. Yuan and J.W. Wu	304
<b>Research on Key Technologies for Internet of Things</b>	
G.L. Shi and Y.X. Liu	308
<b>Simulation on Electronic Throttle Control System Based on D2P</b>	
L. Li, Z.H. Fang, C. Wang, T.T. Hong, J.J. Li, W. Lv and Y. Sun	313
<b>Study on the Computer Network of the Yellow River Reservoir Running Information Platform</b>	
Q.L. Guo and K. Huang	317
<b>The Research on Behavioral Status Judgment Method Based on Skeleton Modeling and Vector Processing</b>	
X.P. Li, H.J. Cui, S. Chen, C.H. Liang, F. Liu, J.Q. Xu and X. Mao	321
<b>The Seismic Damage Assessment and Information Service System</b>	
Z.W. Huang, Y.J. Huang and S.X. Xie	329

<b>Constrained Optimization Solution Based on an Improved Genetic Algorithm</b> C.Y. Li and G.H. Zeng	334
<b>Dynamic Simulation of the Heat Exchanger Based on Simulink</b> Y.X. Tang and F.H. Chen	338
<b>Fitting Algorithm of Parameterized Continued Fractions with Keeping Endpoints and its Application</b> T.S. Zhan and W. Zhao	343
<b>Multivariate Decision Tree Algorithm Based on Rough Set</b> B.X. Liu, Y. Wu and M.S. Li	347
<b>Non-Negative Matrix Factorization Based on Double Sparsity K-SVD</b> Z. Hong, L. Zhen and L. Zhao	352
<b>Research on Embedded Computer Techniques Used in Agricultural Equipments ATS</b> H.D. Zhang, H. Bao, D.G. Chen and J. Yu	356
<b>Research on New Algorithm of Network Topology Design Based on Cloud Integration</b> X.Y. Qu, F. Zhang and H.F. Xue	360
<b>Secret Image Sharing with Threshold Set</b> D. Tang and K. Liu	364
<b>Discrete Element Method Analysis of Mechanical Properties of Railway Ballast during Tamping Process under Different Vibration Frequency</b> T.Y. Zhou, B. Hu, X.J. Wang and B. Yan	369
<b>Finite Element Analysis on Tower Crane Based on ANSYS</b> Q. Liu and Y.H. Zeng	373
<b>Finite Element Model Simplification for the Stator Component in the Hydraulic-Bulging Assembly Process Simulation</b> H.H. Liu and W. Jiang	381
<b>Numerical Analysis of Multi-Pass H-Beam Hot Rolling Processing</b> Q.Q. He, J. Sun, J.Y. Zhao, B.M. Yuan and L.J. Xu	385
<b>Rapid Stereotype of Cylindrical Drip Emitter Based on Computational Fluid Dynamics and Rapid Prototyping Manufacturing</b> L.P. Wang, Z.Y. Wei, X. Zhou and W.J. Yuan	390
<b>Research on IETM Based on Ontology Integration Framework</b> L. Lu and F. Zhang	395

## Chapter 2: Material Science and its Application

<b>48"600lb Full-Welded Ball Valve Wall Thickness Optimal Design</b> C.L. Mo, X.W. Tang and X.M. Guo	401
<b>A Computational Study on Structures, Stabilities and Electronic Properties of Chloro Silsesquioxanes <math>\text{Si}_{2n}\text{O}_{3n}\text{Cl}_{2n}</math> (n=1-5)</b> C.G. Zhang, S.Y. Yu and Z.J. Cao	405
<b>A New Energy Saving Building Type – Cavity Construction System with Trombe Wall</b> Y. Liu and D.Y. Yang	409
<b>A Physical Model for Self-Emitting Magnetic Signals during Fatigue Crack Propagation</b> L.H. Dong, B.S. Xu, H.P. Wang and N. Xue	415
<b>Analysis of Concrete Bridge Asphalt Pavement's High Temperature Stability</b> H. Jiang, J.B. Yuan and H. Yang	419
<b>Analysis of Factors Influencing on Compaction Performance of Hot Asphalt Mixtures by Orthogonal Test</b> L. Ouyang	423
<b>Analysis of Optimization Method for OGFC Mixture Gradation Design</b> L. Ouyang	427
<b>Compressive Creep Behavior of Mg-4Al-1RE-1Ca-0.2Sr Alloy</b> D.F. Xu, C.P. Du and D. Ye	431
<b>Corrosion Resistant Performance of TMCP HSLA Steel for Oil Ship</b> Y.T. Chen and K.G. Zhang	435
<b>Crack Resistance of the Old Cement Concrete Pavement Treatment</b> H. Jiang, J.B. Yuan and H. Yang	440

<b>Design of Welding with Trailing Peening System for Reaction Nitrogen Arc Welding Cladding</b>	
X.Z. Li, J.J. Hao, J.C. Li, J.G. Zhao and Y.J. Ma	444
<b>Detection and Evaluation of Corrosion Damage under Coating by Infrared Thermal Wave Technology</b>	
G.F. Jin, Z.Y. Huang, W. Zhang, Z.W. Yang and L. Zhu	447
<b>Determination of Bisphenol A by Fluorescence Immunoassay Based on Quantum Dots as Probe</b>	
X. Zhang, Y.B. Pang, Y.Y. Song and S.H. Wang	452
<b>Effect of Ca and Rare Earths on Compressive Creep Behavior of Mg-4Al Alloy</b>	
C.P. Du, D.F. Xu and B.W. Wang	457
<b>Effect of Mortar Joint Thickness on the Compressive Strength of Autoclaved Flyash - Lime Brick Masonry</b>	
F. Tang	462
<b>Effect of Particle Size Distribution on the Properties of Sand Mold by Three Dimensional Printing</b>	
H.P. Zhao, C.S. Ye and Z.T. Fan	467
<b>Electroless Deposition of Silver Layer on Atomic-Layer-Deposited TiN</b>	
Y.G. Lee	471
<b>Electroless Deposition of Silver Layer on Silicon of High Density Plasma Bombardment</b>	
Y.G. Lee	474
<b>Flow Stress Behavior Anisotropy of Extruded 7075 Aluminum Alloy Bar at Elevated Temperatures</b>	
G.J. Li, Z.M. Zhang and Y.B. Yang	478
<b>Fractal Characteristics of the Pore Structure of Low Permeability Sandstone</b>	
S.G. Qin, H.L. Wu, M.B. Tian, J.C. Wu and S.L. Yao	482
<b>Fracture Behavior of a Brittle Thin Film on an Elastic Substrate under Residual Stress and Uniaxial Tensile Loading</b>	
B.Q. Yang, X.J. Chen, W.H. Sun, H.Q. Chen, J.W. Pan and Y. Chen	487
<b>Green Preparation of Ultra-Fine Silver Particles in Ionic Liquid</b>	
M.S. Yang, Y. Quan, W. Tang and L.K. Li	491
<b>Improved Design of Long Tunnel's Cement Concrete Pavement Slab Length</b>	
H. Jiang, J.B. Yuan and H. Yang	496
<b>Influence of Ageing on Yield Stress Anisotropy of Extruded 7075 Aluminum Alloy Bar at Ambient Temperature</b>	
Z.M. Zhang, Y.B. Yang and K.R. Xu	500
<b>Investigation into Permeability and Bearing Strength of Plugging Zone Formed by Lost Circulation Materials</b>	
S. Li, Y.L. Kang, L.J. You and D.Q. Li	504
<b>Mechanical and Thermal Simulation of a Multi-Functional Hybrid Composite</b>	
Z.H. Wu, J.Y. Xiao and D.Z. Jiang	509
<b>Mechanical Properties of the Cracked Thick Aluminum Plate Repaired with M40J/Epoxy Composite Patch</b>	
S.T. Li, S.L. Xing, S.W. Wen, C.Y. Peng, S.Y. Wang, R. Li and F.H. Yu	513
<b>Microstructure Evolution of Hydrogenated Ti6Al4V Alloy during Compression</b>	
B.G. Yuan, Q. Chen, H.P. Yu, P. Li, K.M. Xue and C.F. Li	517
<b>Phase Field Method Simulation of Dendrite Crystal Growth of Metal Nickel Based on Fractal Theory</b>	
Z.Y. Ruan, S.D. Zeng, L.X. Lin and L.R. Wu	522
<b>Preparation and Properties of Poly-2,5-dihydroxyaniline/Activated Carbon Composite Electrode</b>	
M. Sun, W. Wang, B.L. He, M.L. Sun, F. Sun, W. Liu, H.L. Ge and Q.J. Zhang	528
<b>Preparation of TiO<sub>2</sub>-Pillared Montmorillonite as Photocatalyst and Photocatalytic Degradation of Methyl Orange</b>	
B.X. Zhao, L.P. Dang, X.L. Zhang, N. Yang and Y.Y. Sun	534
<b>Production Practice of Hot-Rolled Thin Plate of 30CrMo Steel in WISCO</b>	
Z.B. Dong, H.X. Dong and X. Hong	539

<b>Research on Interfacial Cracking of a Cr Coating/Steel Substrate with and without Laser Pre-Quenching Treatment under Thermal Fatigue Loading</b>	
B.Q. Yang, G.N. Chen, X.J. Chen, W.H. Sun, H.Q. Chen, J.W. Pan and Y. Chen	543
<b>Research on the Metal Ablation Thresholds of Picosecond Laser</b>	
J.P. Duan, M. Chen, Z.X. Bai and G. Li	547
<b>Strength Analysis and Calculation of JJ225/42-KC Type Oil Rig Derrick</b>	
X.Z. Yi, S.Z. Jiang, Y.Q. Ji, D. Feng and D.L. Gao	551
<b>Study of Magnetic Performance of Co<sub>2</sub>Z Hexaferrite Doped with Nd<sup>3+</sup></b>	
L.H. Yu, J. Yao, Z.K. Feng and A.P. Huang	555
<b>Study on Pyrolysis Characteristic of the Waste Tires</b>	
L.L. Yu, Z.P. Zhong, K. Ding and Z.C. Liu	560
<b>Study on TiCN/Ti Based Composite Coating Fabricated by Reactive Electric Spark Deposition</b>	
J.J. Hao, L. Gao, S.H. Yang, X.Z. Li and Y.J. Ma	567
<b>Synthesis, Properties of Gadolinium Double-Decker Sandwich-Type Complex Containing Tetrabenzoporphyrin Ligand</b>	
H.Y. Xu, C.H. Hu, Q.F. Liu, W.X. Zhao and Y. Liu	571
<b>Thin-Layer Drying Characteristics and Modeling of Paper Sludge</b>	
H.M. Xiao	575
<b>TiCN Cermet Composite Coating Prepared By Reaction Nitrogen Arc Welding Cladding Process</b>	
J.J. Hao, L.P. Ma, L. Gao, Y.J. Ma and J.G. Zhao	581
<b>Woodceramics Prepared form Liquefaction Wood and Wood Powder</b>	
D.L. Sun, X.C. Yu, D.B. Sun and R. Wang	585
<b>Research and Development of High Strength Architectural Heavy Plates</b>	
M.W. Tong, Z.X. Yuan and K.G. Zhang	590
<b>Study of Micro-Arc Oxidation Process in Magnesium Surface</b>	
Z.M. Chen, P. Lu and Q.H. Dong	595
<b>The Development and Mechanism of Micro-Arc Oxidation Process in Magnesium Surface</b>	
Z.M. Chen, P. Lu, J.Z. Xu and Q.H. Dong	599
<b>Ultrasonic-Assistant Dispersive Liquid-Liquid Microextraction Based on Solidification of Floating Organic Droplet Method for Quick Determination of Polycyclic Aromatic Hydrocarbons in Soils</b>	
C. Zhang, L. Jiang, C. Meng, X.P. Li and Y. Li	603
<b>Numerical Study on NO Mechanism during High Temperature Air Combustion of Natural Gas</b>	
Y.X. Su and C.W. Chen	609
<b>The Influence of Shadow Mask Technique in Sulfur Hexafluoride Plasma on PES Surface Wettability</b>	
M.J. Chuang and J.R. Wang	615
<b>Modeling and Application of Combustion Process in Gasoline Engines under Transient Conditions</b>	
Y.L. Li, S.T. Dong, X. He, J.T. He and C. Zuo	619

### **Chapter 3: Mechatronics and Robot Technology**

<b>A Low Cost Compact Control System for the HIPPO ROV</b>	
B. Wang, C. Wu and T. Ge	627
<b>A Multi-Sensor Suspension Robot for Autonomous Detection and Surveillance</b>	
C.C. Wang, T.E. Lee, K.H. Hsia, L.S. Ma and Y.C. Hsieh	634
<b>A Novel Approach of Thrust Ripple Minimization by Combinational Iron-Cored Primary in Permanent Magnet Linear Synchronous Motor</b>	
N. Xi, J.J. Yang, W.W. Liu, J.F. Shen and Y.X. Cheng	638
<b>A Novel Implementation of UHF RFID Reader</b>	
H.Y. Wang, Q. Yang, J.F. Wu and J.C. Li	642
<b>A Speed Smoothing Algorithm in Micro Segment High-Speed Machining</b>	
L. Luo, J. Hu and F. Deng	647

<b>An Improved Method for Mobile Robot Localization Based on Passive RFID System</b> Q. Yang, H.Y. Wang, J.C. Li and R.J. Shen	651
<b>Application of PCA-CFAR-MNF to Image Enhancement for a UGV FLGPR</b> H.H. Zhang, Y.M. Wang and Q. Song	656
<b>Automated Visual Inspection of Contact Gap and Contact Malposition of Automotive Relay</b> C.H. Hsieh, C.S. Tsai, T.Y. Tseng, Y.S. Wong and S.Z. Zhou	661
<b>Design an Auto-Recharging System for Mobile Robots</b> K.L. Su, J.H. Guo, C.W. Hung and Y.C. Song	666
<b>Design and Analysis of a Robot-Assisted Manipulator in Retinal Vascular Bypass Surgery</b> L. Huang, L.Y. Zhang, Y. Yang, L.J. Shen and Y.Q. Chen	673
<b>Design and Experiment of Shock Absorber Electro-Hydraulic Servo-Testing System</b> X.J. Liu, C.X. Liu and E.L. Zhang	679
<b>Development of a Computer Integrated Testing System for Humanoid Robots Ex-Work Inspection</b> C.S. Tsai and C.H. Hsieh	683
<b>Evaluation and Analysis of Temperature Uniformity for Planar Automotive Waste Heat Thermoelectric Generator</b> X.H. Yuan, Q. Sun, X.J. Hou, S. Chen, Z.E. Liu and Y.D. Deng	688
<b>Image Recognition Method Applying in Formation Control of Mobile Robots</b> Y.C. Lin, C.H. Chen, K.L. Su and J.H. Guo	693
<b>Linear Octree Represented Tool Swept Volume Modeling on Complex Surface Machining</b> X.B. Chen, C.Y. Shan and Y.L. Xiong	699
<b>Nonsingular Terminal Sliding Mode Control of Mobile Robot Using Support Vector Machines</b> X.R. Wu and Y.N. Wang	705
<b>On Vision-Based Orientation Detection Analysis of Industrial Object with Circular-Shape Features</b> F.L. Niu and X.H. Yi	710
<b>Path Planning for the Chassis of Duct-Cleaning Robot Based on Ant Colony Algorithm</b> Q. Zhu, W. Sun, Z.W. Zhou and S.W. Zhang	715
<b>PID Control of an Electric Clutch Actuator</b> B. Wang, H.Q. Yue, Q. Han and B.Z. Gao	719
<b>Ship Rolling Motion Prediction Based on Wavelet Neural Network</b> Y.C. Wang, F.M. Liu and H.X. Fu	724
<b>Structure Design and Analysis of Rescue Robot</b> H. Cheng, H.C. Fan, H.F. Lin, C. Li, Y.P. Mao and X.H. Yi	729
<b>Study on the Trajectory Planning of Hybrid-Driven Planar 3-RRR Mechanism</b> S.T. Song, R.Q. Li, A.L. Wang and Y. Gao	733
<b>The Design and Implement of a Receiver for FSK Signal</b> X.P. Liu, Y. Han, D.D. Zhong and M.Y. Wang	739
<b>The Design of Automatic Solar Tracker</b> H.J. Yu, Y.L. Wang, J.Y. Li and X.L. He	742
<b>Traffic Sign Recognition Based on Vision Bionics</b> Z. Zhang, X.N. Fan, X.W. Zhang, R.Y. Liang and S.M. Lin	746
<b>Trajectory Planning of Knot-Tying Manipulation in Surgery</b> J.J. Xiao, Y. Yang and Z. Wang	752
<b>Visual Simulation for Satellite on Track and Shaded Part Compute for Solar Panel</b> N.X. Li and Y.F. Wang	758
<b>Application of Compensation Wheel on Satellite</b> K.L. Gan, S.M. Ge and L. Wang	763
<b>Attitude Matching for Gimbaled Inertial Navigation System Transfer Alignment</b> Z.J. Ding, H. Cai, H.B. Yang and Y. Cao	768
<b>Design Teaching Machine Tool of Open CNC System on PC</b> Y. Lü and Y.Q. Liu	774
<b>Feature Extraction of Ground Vehicles from High Resolution SAR Imagery Based on Electromagnetic Scattering Characteristic</b> K.F. Ji, X.W. Xing, J.K. Zhang and H.X. Zhou	778

<b>Research on Distributed Remote Monitoring System for NC Machine Tools</b> X.G. Han and B.W. Wang	786
<b>Tool Path Generation Algorithm Based on the Double Spiral Filling Curve</b> J.B. Gong, L. Luo and J. Hu	790
<b>Stiction of Flexural MEMS Structures</b> Y. Liu and Y. Zhang	794
<b>Designs of Eddy Current Sensor Probes Based on Multilayer Printed Circuit Board Technology</b> K. Zhang, X.J. Dai and X.Z. Zhang	801
<b>Implementation of Precision Force Control for an Electro-Hydraulic Servo Press System</b> H.M. Chen, C.S. Shen and T.E. Lee	806

## **Chapter 4: Deep Sea Mining Equipments, Complex Equipment Design and Extreme Manufacturing**

<b>A Single CCD Algorithm to Determine the Position and Attitude during Rolling Phase of Rendezvous and Docking</b> L.L. Zheng and Y.X. Jiang	813
<b>Research of <math>H_{\infty}</math> Robust Control for the Giant Die Forging Hydraulic Press's Synchronous Control System under the Uncertainty Coefficient</b> Y.J. Deng and Z.W. Liu	819
<b>Simulation Analysis of the Vibration Characteristics of the Parallel Hybrid Shaft System</b> J.Y. Zuo, S.J. Liu, Z.H. Huang and Q. Hu	825
<b>Structural Finite Element Analysis and Optimization of Underwater High Pressure Valve</b> X.Z. Yi, S.Z. Jiang, J.F. Zhang, D. Feng and D.L. Gao	832
<b>The Design of the Giant Die Forging Hydraulic Press Synchronous Control System and its Dynamic Simulation</b> Z.W. Liu and Y.J. Deng	836
<b>The Development Status of Underwater Positioning and Navigation Technology Used on Deep Tow System</b> R. Shan, T.H. Zhao and C. Zeng	842
<b>The Dynamic Simulations of Throttle Effect for Hydraulic Engine Mount</b> Y.X. Zhang, T. Hao and Z.M. He	847
<b>The Study on Released Holes of Flameproof Submersible Pump with Inner Motor for Coal Mine</b> X.L. Wang and W.D. Cao	852
<b>Constant Power Speed-Adjusting of Shearer Cutting Motor by Single Neuron Self-Adaptive PID Controlling</b> X.H. Li, Y.T. Hu, Q.D. Chi and S.W. Bai	856
<b>Modeling and Simulation of Emulsion Pump Station Pressure Control System Based on Electro-Hydraulic Proportional Relief Valve</b> C. Zhang, S.H. Zhao, G. Guo and W.K. Dong	860
<b>Real-Time Simulations for Design of Active Safety Systems for Multi-Trailer Articulated Heavy Vehicles</b> X.J. Ding and Y.P. He	865

## **Chapter 5: Control and Detection Technology**

<b>A Bearing Fault Diagnosis Using Wavelet Envelope Spectrum Based on Full Vector Spectrum Technology</b> X.Y. Gong, J. Han, H. Chen and W.P. Lei	873
<b>A Global Fast Integral Operator Terminal Adaptive Sliding-Mode Controller</b> L. Cao, X.Q. Chen and Y. Zhao	880
<b>A Method on Establishment TCM Symptoms Diagnosis Criteria</b> C.X. Chen, S.J. Yao, Y.C. Wang and C.H. Zhou	886
<b>A Nonlinear Control Method of Steering Angle Following Used in Steer-by-Wire System</b> Y.R. Li, J.M. Huang and Z.M. He	890



<b>A Novel Approach in Doppler Measurement Processing</b> K. Dong, X. Guan, Y.Q. Cui and Y. He	894
<b>A Solution about Application System How to Transfer Information Across Different Domains</b> G.H. Yang, Q. Zhang, D.Y. Tang and C.M. Huang	898
<b>Accurate Measurement of Photoelasticity Based on Digital Camera</b> H.H.P. Wu and S.H. Chang	902
<b>Adaptive Interacting Multiple Model Unscented Particle Filter Tracking Algorithm</b> H.J. Liu	906
<b>An Amended Harmony Search Algorithm for Unconstrained Optimization Problems</b> R.P. Li, H.B. Ouyang and L.Q. Gao	911
<b>Application of a New Soft Measurement in Xylitol Fermentation Process</b> Y.Y. Lin, C.F. Xu and B.W. Wang	915
<b>Application of a Optimized Wavelet Neural Networks in Rolling Bearing Fault Diagnosis</b> Y.Y. Lin and B.W. Wang	919
<b>Application of Radius Error Compensation Principle in the Profile Measuring Instrument</b> J.F. Wang and F.G. Ma	923
<b>Application of Time-Frequency Analysis and Back-Propagation Neural Network in the Lung Sound Signal Recognition</b> M.Y. Chen and C.C. Huang	927
<b>Application Research on Haigh Diagram in the Wind Turbine Fatigue Analysis</b> P. Zhao and H.W. Yan	931
<b>Based on Estimation of the Ionospheric Characteristics HF Frequency Prediction Method</b> C. Li, Y.J. Liu, H.Y. Zhang, X.P. Yang and F. Wang	936
<b>Based on Unit Impulse the Signal of Function Analyse with System</b> W.X. Zhang and L. Zhang	940
<b>Category Level Object Discovery Using Dynamic Topic Model</b> J. Guo, H. Sun and C.R. Zhu	944
<b>Convergence of Numerical Solutions to Stochastic Age-Structured System of Two Species with Diffusion</b> B. Liu and Q.M. Zhang	949
<b>Crack Detection of Nonlinear Rotor in Large Rotating Machinery</b> J. Zou, X.L. Shen, S.D. Li and C.Q. Hu	954
<b>Damage Diagnosis of Cable of Large Span Cable-Stayed Bridge Based on the Support Vector Machine</b> D.M. Tan, W.L. Qu, J.B. Zhang, G.Q. Wei and J. Liu	958
<b>Design and Implementation of OFDM Baseband Transmission System Based on CORDIC Algorithm and Pipeline FFT</b> J. Yang, H.W. Ding, G. Zhao and P.P. Shu	962
<b>Distributed Temperature Sensor Network System</b> H.W. Wang, C.L. Zhang, X.M. Ni, Z.G. Gao, W.K. Zhang, X.N. Wang, Z.T. Hao and M.H. Wang	968
<b>Distributed Optical Sensor Network with Self-Monitoring Mechanism for Accurate Indoor Location and Coordinate Measurement</b> L.H. Yang, Y. Wang, J.G. Zhu and X.Y. Yang	972
<b>E-Bayesian Estimation of Failure Probability under Zero-Failure Data with Double Hyper Parameters</b> X.B. Wu	977
<b>Engine Gearbox Fault Diagnosis Using Modified Elman Neural Network and ACO Algorithm</b> H.C. Wu and C.Z. Song	982
<b>Fault Diagnosis for Suspension Signal of Maglev Vehicle Based on Mathematical Model</b> Y.P. Cui, L.H. She, X.L. Li and A.M. Hao	987
<b>Feature Extraction of Rolling Bearing Fault Diagnosis</b> L.J. Sun, L. Zhang, Y.B. Yang, D.B. Zhang and L.C. Wu	993
<b>Imaging of Transmission Equipment Based on Block Compressed Sensing</b> J.J. Zhao, J.X. Sun, S.L. Zhou and L. Hu	998

<b>Intelligent Vacuum-Pumping Detection Device Base on STM32MCU</b> Z.Z. Gao, Q.L. Zeng and S.G. Li	1002
<b>Measurement &amp; Control of Pulverized Coal Concentration in Exhaust Pneumatic Convey System</b> X.S. Yang and J. Yin	1006
<b>Method of Bearing Fault Identification Based on SVM Decision Tree</b> H. Cheng, X. Li, Z.B. Qin and C.Y. Huang	1010
<b>Monitoring Volatile Organic Compound by Visual Recognition Technology of Application</b> M.Y. Chen and H.C. Chen	1016
<b>On-Line Measuring System Using Isotope to Gauge Film Thickness</b> L.Z. Lin, T. Wang and J.S. Zhang	1021
<b>Quality Monitoring and Prognostic of Electronics Using Multidimensional Time Series Method</b> B. Wan, L. Wang and G.C. Fu	1029
<b>Research on a New Azimuth Control Method for Stratospheric Balloon-Borne Gondola System</b> H.H. Wang, Z.H. Yuan and J. Wu	1033
<b>Research on Edge Detection Algorithm for Caption Extraction from Video Frames</b> J. Wu	1040
<b>Research on Execution Process Monitoring for Curved Block Construction</b> J.F. Lei, A.M. Wang, J. Zhou and Z.Y. Li	1044
<b>Research on Signal Transmission Mode of Underground Based on Power Carrier</b> S. Bai, P. Du and S.L. Shi	1049
<b>Semi-Global Adaptive Control Using Barrier Lyapunov Functions for a Class of Uncertain Nonlinear Systems</b> P.N. Chen and L.L. Sun	1053
<b>Study on Remote Monitoring Visualization System of Roof Support</b> W.L. Zhang, X.W. Zheng, B.F. Chen and Y. Peng	1057
<b>Target Damage Assessment Based on the Detection Information</b> T. Li, L. Chen, J.S. Xu and Z.J. Ma	1061
<b>Term Substitution Theorem in First-Order Fuzzy Predicate System</b> Z.B. Zhao	1065
<b>The Application of Variable-Structure Control in Theodolite Fast Capture</b> B. Ge	1069
<b>The Design and Implementation of a Multifunctional Programmable Signal Generator</b> X.Z. Li and X.M. Wang	1074
<b>The Design of Power Equipment Monitoring System Based on Wireless Sensor Network</b> M.W. Wang, Z. Yao and H.Z. Li	1079
<b>The Research on Multi-Level Theses Evaluation Model Based on Fuzzy Cluster Analysis</b> X.P. Li, S. Chen, H.J. Cui, C.H. Liang, F. Liu, X. Mao and Z.H. Wang	1083
<b>Vehicle Detection Based on Binocular Stereovision and Edge Extraction</b> F. Tong and L. Xu	1090
<b>A Laser Projection Device for Locating Points on the Plane Object</b> H. Ding, J.F. Ouyang, X. Ma and Y.G. Yan	1094
<b>A Novel Method of Ship Detection from Spaceborne Optical Image Based on Spatial Pyramid Matching</b> J. Guo and C.R. Zhu	1099
<b>A Remote Control System Based on Short Messaging Service for Intelligent Agricultural Irrigation</b> Z.P. Huo, Z.Y. Wei and Y.P. Tang	1104
<b>An Improved Edge Extraction Algorithm for Lithography Micrographs</b> S.S. Gong and M.J. Li	1109
<b>Design and Research of the Gas Monitoring System Based on ZigBee Wireless Network</b> Y.K. Wang	1113
<b>Design of Colliery Gas Monitoring Alarm System Based on DSP</b> J. He and S.Y. Yuan	1117
<b>Design of Long-Distance Pipeline Remote Monitoring System</b> J. Wu	1121

<b>Discriminative Action Recognition Using Supervised Latent Topic Model</b> H.X. Zou, H. Sun and K.F. Ji	1125
<b>Embedded Digital Oscilloscope Based on STM32 and <math>\mu</math>C/OS-II</b> J. Shi and M. Guo	1129
<b>Extracting Ionosphere Scintillations Index Based on Single Frequency GPS Software Receiver</b> Z. Huang, H. Yuan and Q.Y. Zuo	1136
<b>High Energy Radiographic Testing in Railway Industry</b> S.Y. Wan, D.L. Lu, S.Y. Liu, W.X. Zhang, X.K. Zheng and H.J. Ren	1144
<b>Intelligent Monitoring and Energy Management Platform of New Energy Power Station in the Islands</b> Y.B. Yang, C.G. Zhai and X.H. Ding	1148
<b>Modified Interval Dempster-Shafer Theory and its Application for Target Identification</b> H.J. Liu, H.S. Nie, H.Q. Yu, H.H. Hua and Z. Liu	1153
<b>Overview of Development Plans for Magnetic Bearing Control System</b> X.M. Zhu and W.Q. Teng	1157
<b>Pitch Angle Control Based Improved Cooperative Co-Evolution in Power Generation System</b> Q. Wang, J. Sun, L.Y. Wang and D.Z. Liao	1162
<b>Research and Implementation of Key Technologies of Goaf Coal Spontaneous Combustion Wireless Monitoring System</b> X.L. Qin, M.C. Fu and L.H. Li	1166
<b>Research of Wireless Routing Protocol Used in Underground Wireless Gas Monitoring Network Based on Star-Bus Topology and Non Protocol Stack</b> B. Shen, X.L. Liu, X.L. Qin and M.C. Fu	1170
<b>Robust Reliable Control for a Class of Uncertain Time-Delay Switched Fuzzy Systems Based on Observers Switching</b> L. Zhang, H. Yang and X.D. Liu	1175
<b>Study of Real-Time Monitoring System on the Underground Mining Activities Based on Explosion Source Location Technology</b> X.Z. Meng, Z. ZHANG and Z.S. Wang	1179
<b>The Control System about the Automatic Adjustment of the Press Control Values</b> M. Zhang and Y.Q. Yang	1183
<b>The Design of Intelligent Household Remote Monitoring System Based on GSM and ARM</b> M. Li and F.Q. Li	1187
<b>The Design of Spectrometer Detection and Control System Based on C8051F350</b> Y.Y. Zhao and J. Sun	1191
<b>The Pitch Control Strategy with the Clonal Selection on Quantum Genetic Algorithm</b> H. Wang, D.T. Zhang, J. Dong and Y.Z. Li	1195
<b>The Research on Fast and Efficient Algorithm in Multi - Cameras-Relay Target Tracking</b> X.P. Li, C.H. Liang, S. Chen, H.J. Cui, J.Q. Xu, Q. Xu, F.N. Zhao and X. Mao	1198

## **Chapter 6: Applied Mechanics and Mechanical Engineering**

<b>Application of Vacuum Preloading for Soft Foundation Treatment in Grain Storage</b> Q.X. Liu and Y. Zhao	1207
<b>Study on Common Problem and the Design of Granary Railway Canopy</b> Q.X. Liu and Y. Zhao	1214
<b>The Combined Guiding Hole Technology of Large Diameter DTH Hammer and Long Screw-Pile Driver</b> Q.X. Liu and L. Fan	1220
<b>The Records of Slope Reinforcement Engineering in a Loess City</b> Q.X. Liu and L. Fan	1227
<b>R&amp;D of a Pulsatile Rotary Heart Pump Imitating the Native Ventricle</b> K.X. Qian, T. Jing, H.Y. Yuan, H. Wang, F.Q. Wang and P. Zeng	1234
<b>Application of Fractal Theory in the River Regime in the Lower Yellow River</b> S.M. Tian, X.H. Su, W.H. Wang and R.X. Lai	1238

<b>Bending Deformation of U75V Heavy Rail through Natural Cooling Process</b> H. Song, S.H. Tong, J.J. Jiang, H. Jia, S.Y. Yuan, H. Liu, F.B. Lian and K.X. Li	1244
<b>Evaluation Model of Dike Safety Based on Cusp Catastrophe Theory</b> X.Z. Shen, X.P. Yang and W.D. Ma	1249
<b>Mechanism Dynamics Analysis of Inertia Vibrating Screen</b> Z.B. Xu and J.Q. Min	1254
<b>Novel Shock-Absorbing Spring Stiffness Changes in Automobile Clutch Driven Plate Application</b> Y. Zhang, J.L. He, Y. Cai, Z.Y. Liu and M.Z. Li	1258
<b>Stress Analysis of Tubular Turbine Based on Fluid-Structure Coupling</b> F.X. Zhang, Y. Zheng, C.X. Yang, X.L. Jin and L. Ding	1261
<b>Stress and Displacement Analysis with Multiple Loads</b> D.L. Zhang, B.W. Wang and F. Liu	1266
<b>Study on the Trajectory of Pellet Fragment for Explosive Anti-Riots Munition</b> D.H. Ouyang and S.X. Guo	1269
<b>Videogrammetry of the Model's Attitude in Wind Tunnel Testing</b> Z.Y. Zhang, Z.X. Sun, X.H. Huang and Y. Sun	1273
<b>Design and Manufacturing of the Transmission of Rotary Tiller</b> C.L. Zhang, R.Q. Li and H. Shen	1278
<b>Foundation Design for Reciprocating Compressor</b> G.Q. Deng and R. Wang	1282
<b>Gear Shifting Control for Pure Electric Vehicle with Inverse-AMT</b> Q. Liang, B.Z. Gao and H. Chen	1286
<b>Studies on Dynamic Characteristics of Main Shaft for TM Electronic Jacquard Machine</b> F. Chen and W. Zhang	1290
<b>Effect of Lubricant Viscosity on Gearing Contact Fatigue Life</b> X.M. Qi, C.K. Gao and Z.Q. Zhang	1295
<b>Effect of Mass Flow Rate of Working Fluid on Performance of Capillary Porous Wick Evaporator with Bayonet Tube for AMTEC</b> S.Y. Wu, B.X. Cao, L. Xiao and Y.R. Li	1302
<b>Effects of Sb Addition on Heat-Treated Microstructure and Mechanical Properties of AZ61-0.7Si Magnesium Alloy</b> M.B. Yang, H.L. Li, R.J. Cheng and H.J. Hu	1306
<b>Mechanical Drift of Ultrasonic-Linear-Motor-Driving Motion Platforms</b> J. Sha, Z.Y. Yao and R.R. Geng	1311
<b>Research on Cutter of Field Straw Chopper Strengthened with Flame Spray Welding</b> X.Z. Li, J.J. Hao, L. Gao, L.P. Ma and Y.J. Ma	1317
<b>Research on Flow Field and Temperature Field Characteristics of One Rocket Charge with Complicated Structure by Numerical Method</b> J. Li and Y.H. Zhu	1321
<b>Study on Applicability of Sound Radiation Characteristics of Thin Finite Length Cylindrical Shells Using Wave Propagation Approach</b> B.R. Li, X.Y. Wang, H.L. Ge and Y.P. Jiang	1325
<b>The Research on the Surface Temperature Field of the Gas Cooler in the Microchannel</b> B.Q. He, C.L. Liao and J.Y. Chen	1331
<b>The Surface Characteristic of the Film Flow under Different Surface Tension and Uneven Bottom</b> M. Liu and Z.R. Wu	1336
<b>Vortex Tube Expansion Transcritical CO<sub>2</sub> Heat Pump Cycle</b> Y.F. Liu, C.J. Geng and G.Y. Jin	1340
<b>A Study on a Passenger Car Diesel Engine Fueled with Butanol-Diesel Blend under Typical Operating Condition</b> T.B. Zhou, Z.Y. Han, Z. Chen, B. Du and Y. Liu	1345
<b>Disquisition of Testing System for BMBS Vacuum Booster</b> Y. Shi, Y. Lu and X.Y. Wang	1351
<b>Research on Dropwise Condensation for Binary Mixed Vapor</b> S.H. Hu, X.R. Ma and F. Wu	1355

<b>The Design of a Security System for 13° Wheel Strike Testing Rig</b> X.M. Zhang, K. Yue, D.M. Wang and X.S. Bai	1361
<b>The Mechanism Design and Testing Study on Accelerator Based on The Internal Parallel Moving Gears</b> G.S. Wang, G.X. Ma, D.L. Wang and Z.X. Long	1365
<b>Research on the Time-Frequency Analysis Method to Extract Early Fault Features of Rotating Machinery</b> P.H. Ju and G.B. Zhang	1371
<b>Robust Optimization Design for Spring</b> G. Chen and Y.F. Ma	1376