

## Progress in Manufacturing Automation Technology and Application

Special topic volume on Manufacturing Automation Technology and Application

von

Guanglin Wang, Huifeng Wang, Xiang Zhang, Yuefeng Li

1. Auflage

[Progress in Manufacturing Automation Technology and Application – Wang / Wang / Zhang / et al.](#)

schnell und portofrei erhältlich bei [beck-shop.de](http://beck-shop.de) DIE FACHBUCHHANDLUNG

Thematische Gliederung:

[Mess- und Automatisierungstechnik](#)

Trans Tech Publications 2014

Verlag C.H. Beck im Internet:

[www.beck.de](http://www.beck.de)

ISBN 978 3 03785 827 1

# Table of Contents

## Guest Editorial

## Chapter 1: Machining Technologies and Materials Engineering

<b>Tool Diffusion Wear Mechanism in High Efficiency Machining Ti6Al4V</b> Y.H. Fan, Z.P. Hao, M.L. Zheng, F.L. Sun and S.L. Niu	3
<b>Establishment of the Prediction Model for Ferrite Surface Roughness in Ultrasonic Vibration Grinding</b> G.J. Dong, J.M. Liu, M. Zhou and Z.Q. Xu	8
<b>Chip Morphology in High Speed Precision Turning Process of Hardened Steel GCr15</b> G.J. Chen, L.G. Kong, Q. Gao and X.L. Liu	12
<b>Effect of Cutting Fluid on Machinability of Optical Glass SF6</b> P. Jia	16
<b>Assisted-Grinding in the Laminated Template Electroforming</b> H. Fan	21
<b>Study on Floating Characteristics of an Innovative Liquid Bearing Utilizing Traveling Waves</b> Y.J. Li, M. Zhou and E. Shamoto	25
<b>Study on Device of Electric Heating Drill to Small Hole for Hard-to-Cut Material</b> L.Y. Xu, Q. Wu and Y. Mao	30
<b>The Annealing Effects on the Formability of T2 Copper Foil in Micro Deep Drawing Process by Laser Driven Flyer</b> Y. Hu, H.X. Liu, C.X. Gu, Z.B. Shen and X. Wang	35
<b>Analysis on Charge and Discharge Mechanism of the Modified Lithium Iron Phosphate Positive Material</b> J. He, N. Li, C.F. Gao, Y.W. Luo and X.S. He	41
<b>Ripple Line Fillet Seam Tracking with Visual Sensors in Welding Process</b> Q.L. Bi and Y.M. Quan	46
<b>Ratcheting Properties of Steel 45 and 42CrMo under High Cyclic Stress</b> Y.F. Li, X.D. Pan and G.L. Wang	52
<b>Influence of Workpiece's Size on the Structure and Performance of Grinding-Hardened Layer</b> J.D. Liu, W. Yuan and M. Chen	56
<b>Experimental Study on the Wear of Diamond Tools in Precision Cutting of Titanium Alloy</b> G.J. Dong, Y.L. Zhang, M. Zhou and M.W. Li	61
<b>Investigation of Laser Transmission Joint Strength: Based on the Surface Pitted 304 Stainless Steel and PA66</b> Z.G. Zhao, H.X. Liu, C. Huang, H. Chen, Z. Yan, P. Li and X. Wang	65
<b>The Prediction of Material Removal and Surface Roughness of Workpiece during Abrasive Flow Machining</b> G.Z. Zheng, K.H. Zhang, J.F. Ding, Z.H. Fang and L.B. He	70
<b>Volumetric Error Model of Large CNC Machine Tool and Verification Based on Particle Swarm Optimization</b> Y.L. Liu, D. Gao and G.W. Cui	76
<b>Research of Missile Radome NC Grinding Based on Iso-Scallop Method</b> L.J. Li, W. Sun and W.T. Bai	80
<b>A Coupled Thermal Structural Finite Element Analysis of a Single Pulse Micro-EDM Process</b> C. Guo, Y.K. Wang, Z.L. Wang and B.C. Xie	86
<b>Multi-Factors Interaction Effects of Process Parameters on the Joint Strength of Laser Transmission Joining between PC and PA66</b> C. Huang, Y.Y. Gao, H.X. Liu, H. Chen, P. Li and X. Wang	91
<b>Influence of Cutting Compound on Critical Cut Depth of Glass BK7</b> P. Jia	97

<b>Experimental Research on Ultrasonic Torsional Vibration-Assisted Grinding of Hard and Brittle Materials</b>	
Y.Z. Sun, J. Zhang, H.T. Liu and H.B. Shi	101
<b>Synthetic Analysis and Simulation of One-Side Processing Profile Error of Globoidal Cam</b>	
X.G. Chen and Z.H. Hu	105
<b>Study on the Manufacturing Service Trading Platform Based on Processing Behavior</b>	
J.X. Zheng, G. Zhao and Y. Zhao	113
<b>Research on CNC Grinding Program of Overall End Milling Cutter</b>	
C.F. Sun, N.J. Wang and J.G. Li	122
<b>Optimization Research on Converter Steelmaking Process Parameters Based on DOE</b>	
B.H. Lu, Y.K. Li and B.Z. Qu	128
<b>Theoretical Research and Simulation of Grit's Motion for Internal Ultrasonic Vibration Grinding</b>	
B. Zhao, Y.M. Li and P.Y. Bian	133
<b>Technology on Ni-ZrO<sub>2</sub>-CeO<sub>2</sub> Nanocomposites by Pulse Electroforming in an Ultrasonic Field</b>	
Y.Y. Xu, Y.J. Xue, J.S. Li, Y. Liu and F. Yang	138
<b>Study on the Surface Quality of Silicon Nitride Ceramics in Ultrasonic Vibration Grinding</b>	
G.J. Dong, M. Zhou and S.N. Huang	144
<b>Modification on TiO<sub>2</sub>-a Photosensitive Material</b>	
M. Sun, Y. Hu and H. Guo	148
<b>Preparation and Experimental Study of the Complex Shape Carbide Diamond Coated Tools</b>	
Y.Y. Zheng, C.L. Zhang and X.X. Xu	153
<b>Analysis of Characteristics of Movement and Stress in Centerless Superfinishing</b>	
J.H. Ma and P. Guo	158
<b>Grinding Experiments on PTMCs with Vitrified CBN Wheel</b>	
Q. Miao, W.F. Ding, B. Zhao, J.H. Xu, Z.W. Liu and J. He	163
<b>Ultra-Precision Fly Cutting Experimental Study of Semiconductor Laser Heat Sink</b>	
Y.L. Chen, H.T. Liu, Y.Z. Sun, Q. Zhang and Y.C. Liang	167
<b>The Forming Mechanism of Surface Defects on Machined Surface in High-Speed Cutting of SiCp/Al Composites</b>	
Y.J. Wang, M.Q. Pan, T. Chen and L.G. Chen	171
<b>Research on the Online Test of the Fly Cutting Machine Tool Spindle</b>	
P.Q. Fu, Y. Zhang, F.H. Zhang and J.H. Wang	177
<b>Study of Carbon/Carbon Composite Material Surface Morphology on Ultrasonic Vibration Assisted Milling</b>	
Z.D. Li, B. Zhao, J.L. Tong and P. Duan	181
<b>Research on Heat Compensation Control of Giant Magnetostrictive Material in the Micro Feed</b>	
B.N. Chen, F. Chen and X. Li	186
<b>Simulation-Based Analysis of the Gas Bearing Utilizing Traveling Waves</b>	
Y.J. Li, M. Zhou and E. Shamoto	192
<b>DEFORM-3D Based on Machining Simulation during Metal Milling</b>	
Z.L. Wang, Y.J. Hu and D. Zhu	197
<b>Finite Element Simulation on High Speed Cutting of Hardened 45 Steel Based on ABAQUS</b>	
G.H. Li, H.J. Qi and B. Yan	202

## **Chapter 2: Mechanical Engineering and Engineering Design**

<b>Molecular Dynamics Simulation Study on Diamond Tool Wear in Cutting Aluminum-Based Workpieces</b>	
G.J. Dong, Y.J. Zhang and M. Zhou	211
<b>Gear Strength Optimization Analysis of Automobile Gearbox Based on the Software of MASTA</b>	
H. Wang, F.J. Yu, K.L. Huang, Y.X. Li and W.Q. Shen	216
<b>Influence of Fluid-Structure Interaction on Control Accuracy of a High-Flow Control Valve</b>	
F. Cao and Y. Wang	220

<b>Design and Simulation of a New Type of Device for Dividing Air Flow Equipped on the Agricultural Product Baking House on Solidworks</b> J. Liu, Z.W. Jia, R.X. Guo and Y. Li	224
<b>Eccentric and Nonuniform Axial Force Analysis Based on Steel Tube Components of Recycled Resource</b> Y.C. Tang, W.X. Feng and Y. Zhang	228
<b>Crashworthiness Design Analysis of Vehicle Door Using Simulation Experiment Design and Multi-Objective Genetic Algorithm</b> X. Wang, W.L. Lou, H.X. Liu and D.L. Liu	234
<b>Design and Implementation of the Stone Elliptical Arc Contour Fitting Algorithm</b> D.W. Xu, J.Q. Liu, X.F. Wu and W.Q. Gao	241
<b>Automatic Measuring System of Servo Valve Overlap Value Based on Hydraulic Cylinder Switching Oil-Way</b> X.D. Pan, G.L. Wang, X.X. Cheng and H.C. Lv	248
<b>The Influence of Micro-Texturing Dimple on the Bearing Capacity of the Elastohydrodynamic Lubrication Based on CFD-FSI Fluid-Solid Coupling</b> J. Liu, H.X. Liu, J. Li, S.L. Feng, T.Y. Wang and X. Wang	253
<b>Research of a Small-Sized Magnetic Hydro-Cylinder without Piston Rod</b> Y.L. Song, S.P. Zhang and S.M. Gao	259
<b>Gear Modification Analysis to Improve the Vibration and Noise of Automobile Transmission</b> Y.X. Li, W.Q. Shen, Y.J. Zhao and X.Y. Hu	265
<b>Evaluation Method of Assembly Yield in Three-Dimension Single-Station Assembly Process Based on Number-Theoretical Net and 3DCS</b> Z.J. Wen, F. Zhang and J. Hu	270
<b>Research on Technologies of Augmented Reality for CNC Machining Process Simulation</b> Z.Y. Ma, G.Y. Yang and X.W. Su	276
<b>Research on Synthesized Modular Modeling Based on General Mathematic Model of Arbitrary Rotary Helical Surface</b> L.Z. Gu and Z.Z. Zhou	283
<b>Design and Implementation of the Circular Saw CNC Machining of the Stone Bridge Cutting Machine</b> X.F. Wu, J.Q. Liu, D.W. Xu and W.Q. Gao	289
<b>High Pressure Pneumatic Control Valve Performance Test System</b> X.D. Pan, G.L. Wang, G.Y. Shen and R.Q. Song	295
<b>Research on Mathematical Modeling and Kinematic Simulation of Elliptic Family Gears</b> L. Xia, D.Z. Li and J. Han	300
<b>Parametric Design of the Coupling of Oilfield Turbodrill</b> S.Z. Zhou and S. Zhang	305
<b>Experimental Study on Electrochemical Abrasive Jet Machining</b> Y. Zhang, C.G. Zhang, H. Dai, Y.M. Zhu and Y.C. Ji	310
<b>Research and Application of NC Machine Tool Energy Consumption Control Optimization</b> X.L. Xu, H.L. Wang and T.B. Yu	314
<b>Product 3D Dynamic Display and Lectotype System</b> J.H. Ye	320
<b>Production Pulling and Line Feeding Service for Automotive Assembly</b> Y. Zheng, C.P. He and L. Xue	325
<b>Application Analysis of Virtual Simulation Technology in NC Machining</b> X.Y. Hu, Y.X. Li, H. Wang and K.L. Huang	331
<b>On Adaptable Design and Application of Mechanical Interface</b> H.H. Xu, Z.Q. Zhang, R.D. Li and Z.F. Deng	335
<b>A 3D Engineering Model Retrieval Algorithm Based on Relevance Feedback and Features Combination</b> T. Zhuang, X.T. Zhang and Z.X. Hou	340
<b>Topology Optimization for the Base of Parallel Loading Device</b> H.G. Wang, L.P. Wang, N.M. Kang and R.C. Li	345
<b>Design for Mechanical Structure of Energy Recovery Damper</b> Z.Y. Wu, J.B. Cao, S.J. E, T.F. Zhao, C.X. Chen, C.H. Yang and H.H. Bao	349

---

<b>Structure Scheme Design of a Large Ultra-Precision Hydrostatic Rotary Table with a High Diameter-Length Ratio</b> Y.Z. Sun, J.D. Wu, J.H. Zhang and H.T. Liu	353
<b>Study on the Gear Parametric Modeling and Database Building Based on UG/OPEN Grip</b> L.Z. Gu and W.Z. She	357
<b>Kinetic Analysis of Wind Turbine Blades</b> J.J. Zhang, W.L. Sun and W.Y. Wan	362
<b>A RecurDyn Based Dynamic Simulation Method for Coupler</b> B.Z. Qu, X. Liu and B.H. Lu	368
<b>The Application of a Grating Tiling Device with Parallel Mechanism in an Inertial Confinement Fusion (ICF) System</b> Z.X. Shao, W.J. Zhou and H.Y. Fu	373
<b>The Establishment of Agricultural Engineering Information System for Farmer Cultivation</b> H.J. Li and G.J. Tong	381
<b>Integrated Product Data Link for Discrete Manufacturing</b> D. Wu and G.F. Yin	386
<b>Thread Measurement Algorithm Research and Software Development</b> W.B. Wu, D.X. Shao, W.Q. Wang and G.L. Wang	392
<b>Remanufacturing Cleaning Technology and its Application in Concrete Pump Truck</b> P.H. Duan, W.H. Yue, Y.X. Zhu and J.X. Weng	398
<b>Reliability Analysis and Optimization of Large Mining Dump Truck Steering Knuckle</b> J.L. Liu and X.Z. Hu	405
<b>Finite Element Analysis of the Impeller on the Centrifugal Fan of the Crawler Wind Fire Extinguisher</b> C.M. Yang, F.M. Jing, L. Zhan and Q.H. Wu	411
<b>Design for Mechanical Structure of New Nano Electric Boiler</b> R.K. Wang, J.B. Cao, H.P. Luo, S.J. E, T.F. Zhao and X.X. Tang	416
<b>The Application of Self-Adaptive Design in Improvement of the Restoring Strand Operation Mechanism</b> Z.S. Liu	420
<b>RE of Crucial Parts of Brake Caliper Unit Based on the Integration of Multi-Measurement</b> R.Q. Song and G.L. Wang	425
<b>Hydraulic System Simulation of 3-UPS Parallel Mechanism Based on ADAMS/Hydraulics</b> B.B. Yan, W.B. Ren, B.L. Yin and Y. Li	430
<b>A Experiment Study of Rolling Bearing Fault Diagnosis Based on Sensorless Detection Method</b> X.J. Shi, X.F. Gong, H. Guo and J.S. Si	434
<b>Simulation and Optimization of Mining Dump Truck Steering Mechanism</b> Y.Q. Wu, Z.J. Wang and X.Z. Hu	439
<b>The Knowledge Innovation Mechanism and Model Simulation in Contemporary Integrated Manufacturing System</b> B.W. Zhong, Z.Q. Jin, X.H. Wang and H. Jiang	446
<b>Design of the Undulating Fin Propulsor with Rajiform Swimming Mode</b> Y.W. Wang, J.B. Tan, B.T. Gu and D.B. Zhao	451
<b>Research on Direction and Position of Connecting Bolt Looseness of the Tower</b> S.J. Song, L.L. Hao and L.B. Cheng	460
<b>Modeling and Performance Simulation for a Picking Manipulator Based on Modelica</b> H.J. Wang, G.G. Huang, X.J. Zou and Y. Chen	467
<b>Researchment on Valve Sleeve Bore's Cylindricity Pneumatic Measurement Technology Based on Error Compensation</b> Q.W. Zeng and G.L. Wang	476
<b>The Applications of AEI System for Cultivation of Professional Farmer in Agricultural Modernization Process</b> H.J. Li and G.J. Tong	482
<b>Development of Stiffness Measurement Instrument for Precise Elastic Elements in Electro-Hydraulic Servo Valve Based on Charge-Coupled Device</b> J.X. Yang, D.X. Shao, R. Lin and G.L. Wang	488

<b>Simulation and Experiment Study of Heat Dissipation of Heavy-Duty Vertical Lathe Workbench</b>	
J.P. Shao, X.D. Yang, J. Zhu, X.N. Mu and K.J. Wu	493
<b>The Development of NC Tenoning Machine's Control System Based on HUST Controller</b>	
J.H. Tao, B. Chen, X.J. Fei, H. Liu and Y.W. Bao	498
<b>A Miniature Refiner Plate Design and Manufacturing</b>	
Y. Ma, Q.H. Wu, C.M. Yang and F.M. Jing	503
<b>Additional Damping Conditions Analysis and Calculation for Exciting Force and External Load</b>	
Y.X. Liu and Y.M. Wang	507
<b>Develop the Low Pressure Large Flow Overflow Valve</b>	
X.Z. Zhao, X.G. Wang and Y.M. Wang	512
<b>Finite Element Analysis on Real Contact Area Based on Fractal Characterization</b>	
J.C. Wang, B.Q. Xing and T. Zhao	517
<b>Analysis on the Influence of the Strength and Stiffness under the Contact Conditions for Friction Plate</b>	
X.Z. Zhao, X.G. Wang and Y.M. Wang	523
<b>Dynamic Characteristic Analysis of High-Speed Milling Motorized Spindle Based on ANSYS Workbench</b>	
C. Li and Y.X. Yao	530
<b>Experimental and Numerical Studies of Violin Bridge Vibration Mechanism</b>	
C.Z. Zhang, B.Y. Ye, L.D. Liang, X. Jia and G.M. Zhang	536
<b>Analysis and Optimization of Embedded Flexible Clutch Brake Wheel and Brake Claw Structure</b>	
Y.M. Wang and X.G. Wang	542
<b>Numerical Simulation of Lubricant Liquid Film of the Laser Surface Textured Micro-Pore Face Mechanical Seal</b>	
P.G. Zhang, B.Q. Gu, L. Wei and Q.H. Liu	548
<b>Design of a Kind of Complex Part and the Application of Drawing Methods</b>	
Z. Lin and R.Q. Song	554
<b>Research of Automatic Measurement Technology for Oil Thimble External Thread Parameters</b>	
Y.G. Wei and Z.X. Wang	558
<b>Oil Film Carrying Property Research of Hydrostatic Vertical Guideway of CNC Vertical Lathe</b>	
Y.Q. Zang, Y.Z. Qu, Z.Y. Shen, W.Q. Wu, F.B. Wu and L.Y. Xu	564
<b>Thermal Characters of the Air-Cooled High Speed Motorized Spindle for Wood-Working Machine</b>	
D.G. Ma and X.B. Jiang	568
<b>Fatigue Life Prediction Methods Evaluation for Remanufacturing Mechanical Parts</b>	
J.X. Weng, W.H. Yue, Y.X. Zhu and P.H. Duan	573
<b>Influence of FTS's Dynamic Character on the Machining Error</b>	
G.A. Hou and T. Sun	580
<b>ABAQUS-Based Numerical Computation and Experiment Research on Silicon Rubber Mould's Deformation during DPVC Process</b>	
Z.Y. Zhang, H.G. Zhang, F.P. Wan, Y.Y. Liu and Q.X. Hu	584
<b>Optimization of Spring-Tube Fixture Based on Elasticity</b>	
W.X. Liu, H.F. Wang and G.L. Wang	590
<b>Research on the Motor Friction Model of Electro-Hydraulic Servo System</b>	
X.J. Wang, W.X. Han, X. Cui, S.Z. Li and C.Z. Du	594
<b>Fast Surface Construction and NC Milling Based on 3D Scanning</b>	
Z.H. Wu, Q.K. Zhou, D.P. Fan, J.N. Zhu and J.M. Wang	598
<b>Wooden Door Slot Cutting System of CNC Machine Finite Element Analysis</b>	
X.B. Jiang, Q.H. Wu, F.M. Jing, C.M. Yang and G. Luo	603

### Chapter 3: Industrial Robot Technology

<b>Research on the Automatic Programming System of the Bone Scaffold 3D Printer Manufacturing</b>	
Y.Y. Liu, F.H. Zhang, W.H. Chen, F.F. Yan, L.L. Zheng and Q.X. Hu	609
<b>Research on the Trajectory Control Method for Laser Marking</b>	
Q.W. Yu, D.Y. Wang, Y. Fang and Y. Zhu	614
<b>Redundant Points Removing of SFS Reconstructed Surface</b>	
F.H. Wu, Q.J. Yin, J.F. Wang and Y.X. Li	618
<b>Control Dominant Factors Analysis for Under-Actuated Vehicle Platoon Stability System</b>	
R.H. Zhang, T. Liu, Y.L. Pei and S.Q. Yang	626
<b>3D Electronic Products Surface Measurement System Based on Machine Vision</b>	
Y.F. Zhu, L. Zhang and K.T. Li	630
<b>Research on the Control System of Flexible Polishing Machine Based on the Motion Control Card</b>	
X.L. Zhu, C.J. Huang and X. Zou	637
<b>A 5-DOF Combined Robot Platform for Automatic 3D Measurement</b>	
J. Qian, H.B. Zhu, S.W. Wang and Y.S. Zeng	641
<b>Analysis and Modeling of the Thermal Errors of Carriage System of a Precision Machine Tool Driven by Linear Motor</b>	
S. Yuan, F.Y. Peng, L. Zhou and P.F. Yao	645
<b>The Technology of Fast 3D Reconstruction Based on Stereo Vision</b>	
K. Zhang and Z. Gao	654
<b>The Parallel Mechanism and Variable Acceleration Control Method</b>	
X.B. Ouyang, K.T. Li, H.J. Xia, S.J. Wang, H.W. Zhou, C.W. Hu and W.D. Peng	659
<b>Pose Estimation of Round-Shape Workpieces Based on Genetic Algorithm</b>	
G.C. Lin, X.J. Zou, M.S. Zhu, K.Y. Chen and Z.X. Ke	665
<b>Research on Motion Control System of Clamping Thin-Walled Tube Based on PID Neural Network</b>	
C.X. Xie, C.F. Gao, X.S. He and Z.C. Dai	670
<b>Systematic Odometry Error Modeling and Correction in Wheeled Robots</b>	
Z.D. Yu, Y.B. Pei and D.X. Shao	675
<b>Research on Distributed Multi-Axis Motion Control System Based on CANopen</b>	
G.Y. Yang, Z.M. Tang and Z.Y. Ma	680

## **Chapter 4: Computer Integrated Manufacturing System and Contemporary Integrated Manufacturing System**

<b>Research on the Integrated Design Method of the Compliant Mechanism with Electromagnetic Actuators</b>	
Y.H. Peng, S.X. Fan, L.C. Zhang, H. Liu and D.P. Fan	689
<b>Research on Testing and Compensation of Speed Jumping Performance in Actuator</b>	
J.Y. Xu, Y.F. Li and G.L. Wang	695
<b>Research on Modeling and Simulation Analysis of Direct Drive System in Simulink and Simscape Environment</b>	
H.B. Liao, S.X. Fan, M. Hei and D.P. Fan	699
<b>Design and Numerical Analysis of Non-Uniform Electromagnetic Field Based on the Wedge Magnetic Pole</b>	
P. Huang, C.F. Gao, X.S. He and H.F. Ji	706
<b>Information Modeling and Visualization of Assembly Fat Model for Large-Scale Product</b>	
J.S. Bao, D.L. Wu, Q.H. Cheng and J.H. Pan	711
<b>Research on Workshop Equipment Information Transmission Based on Wireless Sensor Network</b>	
G.Y. Yang, L.P. Chen, Z.Y. Ma and Z. Zhang	719
<b>Co-Designing Method for Mechatronic System Based on Matlab and Recurdyn</b>	
M. Hei, S.X. Fan, H.B. Liao and D.P. Fan	725
<b>Energy-Efficient Routing Protocol of Wireless Sensor Network for Industrial Application</b>	
Z.Y. Ma, G.Y. Yang, J.J. Zhou and X. Gan	732

<b>Design of Lifting Electromechanical System for Onboard X-Band Weather Radar Antenna and Data Filtering Analysis</b>	
X.H. Wei, B.H. Yang, W.D. Lu and L.W. Kong	740
<b>Study on Hybrid Vehicle Regenerative Braking Control Parameters Affecting to Vehicle Performance Analysis and Simulation</b>	
Z.W. Zhang	745
<b>Research on Key Technology of the Simulation Visualization System of the Virtual Wind Farm</b>	
X.J. Wan, W.L. Sun and Q. Yu	749
<b>Mathematical Model and Characteristic Analysis of Electric Loading System</b>	
X. Zhang, G.L. Wang, X.D. Pan and H.B. Xie	754
<b>Simulation Research on Fluorescent Lamp Power Factor Based on Multisim</b>	
R.K. Wang, T.F. Zhao, J.B. Cao, H.P. Luo, S.J. E and C. Zhou	761
<b>Research and Implementation of Multi-Threading Technology on Embedded Hobbing CNC</b>	
Y.G. Duan, J. Han, X.Q. Tian and L. Xia	765
<b>The Development of Detection System for Three-Dimensional Alternating Electromagnetic Radiation</b>	
Z.P. Guan, S.B. Chen, Z.Q. Zhang, N.S. Bao, Z.P. Lu, M.Y. Deng and G. Cheng	770
<b>Reach on Micro-Motor Acoustics Fault Diagnosis Based on Loose Wavelet Neural Network</b>	
Y.G. Li, G.T. Wang, Z. Li and X.L. Yin	775
<b>The Design and Simulation of the Magnetic Field Formation Components Based on the Technology of Electro Permanent Magnet</b>	
S.Q. Yang, W.H. Li, H.L. Chen and J.Y. Guo	781
<b>Research and Application of Visualized Real-Time Monitoring System for Complex Product Manufacturing Process</b>	
T.D. Li, W. Qin, J. Zhang, H. Li, Z.G. Xu and H.P. Xiao	787
<b>Development of Field Control System of Automated Guided Vehicle Based on Wireless Local Area Network and CAN Bus</b>	
Y. Wang, Z.D. Yu, C.X. Bao and D.X. Shao	792
<b>Frequency Constant Pressure Control System Based on PLC</b>	
Q. Zhu and Z.W. Feng	798
<b>Design for New Actuator Based on Electroactive Polymer</b>	
Z.Y. Wu, T.F. Zhao, J.B. Cao, S.J. E and C.X. Chen	804
<b>Research and Development of Ultrasonic Testing Computer-Aided Process Planning (UTCAPP) Based on Standard</b>	
J.T. Zhang, H.B. He and C. Tan	808
<b>Study on the Test System of ERF's Performance</b>	
X.S. He, P. Huang, K. Fei, X.Y. Zhang, W.Z. Chen and C.F. Gao	813
<b>Research on Control Algorithm of Electric Loading System</b>	
X. Zhang, G.L. Wang, X.D. Pan and H.B. Xie	818
<b>Study on Small Power BLDCM Drive System</b>	
Z.X. Wang, F. Chai, Y.G. Wei and Y.L. Song	823

## **Chapter 5: Other Related Topics**

<b>Evaluation Study of Subgrade Service Condition Based on Falling Weight Deflectometer</b>	
X. Qiu, Q. Yang, X.H. Luo and B.R. Wang	831
<b>Research on VSP Microcosmic Emission Model and Numerical Simulation for Motor Vehicle</b>	
H.W. Wang, H.Y. Wen, F. You and G.F. Yang	835
<b>Road Engineering Optimization Based on Driving Reaction</b>	
Z. Cao, X. Wu and Q. Yang	841
<b>Study on the Numerical Simulation of Femoral Injury</b>	
R.M. Chen, W. Aiyiti and J. Wang	845
<b>Study on Exhaust Diffusion Control in Urban Trunk Intersection</b>	
Q. Yang and M.M. Huang	851
<b>Laser Transmission Joining of PC and POM Process: A Finite Element Simulation</b>	
H. Chen, Y.Y. Gao, X. Wang, P. Li, C. Huang and H.X. Liu	856



---

<b>Study on Correction Method of Subgrade Modulus Based on FWD</b> X.H. Luo, Q. Yang and X. Qiu	862
<b>Multi-Constrained Quadrilateral Mesh Generation for Ship Assembly</b> Q. Wang, J.S. Bao, C. Xun, Y.J. Pan and J.J. Tang	866
<b>Prediction Model of Dynamic Resilient Modulus of Cohesive Subgrade Soil Based on Triaxial Test System</b> X. Qiu, Q. Yang, B.R. Wang and X.H. Luo	873
<b>Smoothing of SFS Reconstructed Surface Based on Genetic Algorithm</b> J. Wang, F.H. Wu, X.L. Li and J.C. Wang	877
<b>MATLAB-Based Vehicle-to-Vehicle Intelligent Lane Changing Model and Computer Numerical Emulation</b> X.C. Yu and W. Jiang	885
<b>Organization Optimization of Traffic Engineering in Urban CBD</b> M.M. Huang, Q. Yang and S.L. Xiao	890
<b>Taguchi Robust Design of Exhaust System Based on the Parametrically Process of Parts Location</b> T.F. Li, H.X. Liu and Y.X. Mao	894
<b>Working Mechanism of Brake Unit on Railway Vehicle and its MBD Simulation Experiment</b> B.Z. Qu, Y. Liu, B.H. Lu, Y. Zhang and H.B. Zhang	901
<b>SWCC Based Prediction Model of Equilibrium Moisture of Clay Subgrade with High Groundwater Table</b> B.R. Wang, Y.J. Hu and X. Qiu	906
<b>A Quality Tracing and Management Model of Complex Products Based on SPC and Two-Dimensional Code</b> X.L. Yang, W. Qin, J. Zhang, H. Li, Z.G. Xu and H.P. Xiao	911
<b>Mechanical Analysis and Structural Optimization of the Parabolic Trough Solar Collector</b> J.P. Liu, B.Y. Ye, G. Xun and Y.P. Shi	916