Table of Contents

Preface and Organizing Committees

Chapter 1: Engineering Design. Theory and Practice

Z.F. Yang, Z.Y. Ma, Y.L. Lv, X. Zhang and Y.S. You	3
Research on Concept System of Rotation-Mirror Symmetry in Mechanical Systems Z.Y. Ma	7
Overview of Pneumatic Pump Reversing Mechanism Y.S. You, Z.Y. Ma, Y.L. Lv, Z.F. Yang and X. Zhang	11
Multi-Objective Optimization Design for Double Toggle Clamping Unit of Injection Molding Machine	
C.J. Lei, J.H. Yu, H.F. Zhan, L. Chen and Z.R. Jiang	15
A Study of High Intensity Focusing Ultrasonic Transducer L. Liu and J. Sun	20
Improved Design of 2-DOF Micro-Positional Stage Based on Parallel Structure with Flexible Sheet	
S.Y. Zheng, Y.G. Cui and F. Fang	24
The Influence of Pillow Material on Body Distribution and Sleeping Comfort in Supine Position	20
L.M. Shen, J.J. Hou, Y.D. Zhu and J. Song	30
The Uncertainty Analysis of Health Management Strategies for Aero-Engines Z.H. Wen, X. Yin and Y.P. Liu	34
Research on Improving Oracle Query Performance in MES D.Y. Zhao	39
Winding Modeling and Driving Method of Varying Length Rope Based on ADAMS J.J. Wang, G.H. Cao, J. Song and R.H. Wu	43
Representing the Reasoning Process of Shape Transformations in Sketches by Combination	
of Ontology and Shape Grammar Y. Wu	47
A New Type Design of Lighting Current Strength Detection Sensor T.L. Wang, K. Leng, Y. Dong and F.X. Feng	51
Design of Combined Cam Used in the New Jacquard Device Based on PROE and AutoCAD F.J. Liu and Y.H. Yuan	56
Application of VC++ and MATLAB Mixed-Programming Based on MATCOM in Signal Processing	
L. Zhang, G.Y. Zeng, D.F. Zhao and H.Q. Zeng	61
Structure Improving Design of Compressor Valve Seat Base on FLUENT J. Zhang, X.B. Li and X.Q. Fan	65
Seam Tracking Monitoring during High-Power Fiber Laser Welding X.D. Gao and D.Y. You	69
Tribological Characteristics of Nickel-Aluminium Bronze CuAl10Ni5Fe4 against 30CrMnSiA Steel after the Prior Corrosion Treatment	
Z.H. Tan, Q. Guo, W.K. Zhai and Z.P. Zhao	73
Multi-Point Sequential Sampling Method for Complex Engineering Optimization Problems S.L. Zhang, P. Zhu and W. Chen	78
Research on Field Balancing of Rotor X.Q. Chen, Y.J. Jia and G.Z. Cheng	83
The Fiber Measuring Method for Rotating Parts Comprehensive Vibration P. Xiong, D.F. Zhao, G.Y. Zeng and J. Huang	87
Segmentation of Molten Pool Infrared Images Using Morphology during High Power Disk	
Laser Welding Y.X. Zhang and X.D. Gao	91

Development and Current Status of Multi-Level Converter Y. Xie, B.C. Chen and Y.J. Chen	95
The Roller Disassembly and Assembly Machine Controlled by PLC G.Z. Cheng, Z.Q. Liu and L.H. Dang	99
Effect of Background Lighting on Atmosphere Perception J.X. Xu and L.M. Shen	103
Simulation of Shell-Side Performance of Novel Heat Exchanger X. Cao, W.J. Du and L. Cheng	107
The Blemish Identify System of Friction Welding Based on GA-BP Model X. Yin, Z.H. Wen and Y.P. Liu	111
The Establishment and Analysis of the Laptop Bag Semantic Space Based on the Semantic Differential Method L. Han, J.M. Che and X.R. Wan	115
The Design of Flying-Sawing Machine Control System Based on Fuzzy Control C.X. Ning, X.S. Zhang, F. Zhu and L. Li	119
The Design and Application of NC Macro Programs Y.J. Jia and G.Z. Cheng	123
Research on the Characteristic Description and the Numerical Model of 4G15-6L Automotive Engine	
L. Zhang, Y. Chen, X.M. Yang, C.Y. Zhou and W.J. Zhang	127
Design of a Control System for a Turret Based Test Handler Z.S. Zhang and F. He	131
Nonlinear Dynamic Analysis of Helical Gear Considering Meshing Impact F. Wang, Z.D. Fang and S.J. Li	135
State Analysis of Mine Hoist Y.S. Zhang, Y.J. Jia and G.Z. Cheng	139
Research on the Integration of Object-Oriented Petri Nets and QUEST B.S. Wei, W.H. Ye and X. Liu	143
The Spiral Collection-Scraper Conveyor Loader X.Z. Zhu, Y.T. Zheng and G.Z. Cheng	147
Research on a Computerized Form and Position Error Measurement Instrument P. Liu and H.Y. Miao	151
Thermal Characteristic Analysis on the Headstock of a High Precision CNC Machine Tool Y.M. Zhang, J.L. Han and R.J. Gu	157
The Research of High-Precision Turntable's Countertop Tilting Dynamic Testing Technology	
X.M. Yang, S. Lv, L.X. Li, J. Liang and L. Zhang	162
Color Image Segmentation of Plume for Monitoring Disk Laser Welding Process T. Wang and X.D. Gao	166
Numerical Simulation and Analysis of Tapered Interference Fit of Atomizer Disk S.H. Lin, C.J. Li, J.P. Ding and D.C. Chen	170
Analysis of Dynamic Characteristics of Key Parts of Centrifugal Atomizer in Waste to	
Energy S.H. Lin, J.P. Ding, D.C. Chen and M. Xu	175
Dynamics Simulation on Rigid-Flexible Coupled Sliding Guideways in Powered Tool Turret of NC Lathe	
S.P. Zhou, Y. Zhao, F.L. Huang and H.J. Li	181
Research on the Seismic Behaviors of Link Beam for Eccentrically Braced Low Yield Point Steel Frames H.J. He, X.L. Cao and J.P. Hao	185
Electromagnetic Tube Compression: A Novel Experimental Technique and Finite Element	103
Simulation L.Z. Li, X.L. Dong and G.Y. Zhou	189
Numerical Algorithm of Tooth Profile of Noncircular Gear Pair M.H. Fang	194
Development of the Smoothed Natural Neighbor Petrov-Galerkin Method K. Wang, S.J. Zhou and Z.F. Nie	198

Modeling and Simulation of the PMSM-Precision Reducer System with Modelica Z.H. Li, H.G. Yang, J. Yu and Y.P. Gong	202
Dimension Error Analysis and Simulation of Sheet Metal Multistage Assemblies	202
D.Z. Yu and X.H. Xu	208
A Failure Criterion of Friction Pair under Boundary Lubrication Y.T. Yan, M. Yang, Z.L. Sun and L.F. Liu	213
Software Design of Pulse Generator Based on Single-Chip Computer and CPLD J. Gao, X.F. Ma and Q.Y. Liu	218
Weld Seam Detection Based on the Genetic Algorithm D.K. Ding and W. Tan	222
Study of Temperature Decoupling Fiber Acceleration Sensor Based on the Dual-FP	
Structure H.H. Yie, Y.F. Feng, H.P. Ven and V.O. Huang	226
H.H. Xie, X.F. Jiang, H.P. Yan and Y.Q. Huang Finite Element Study on Dynamic Tension of Metal Ring by Electromagnetic Launching	226
Y.Q. Fu, H. Chen, X.L. Dong and G.Y. Zhou	230
Numerical Simulation of 2D Model of Diffuser for Tidal Turbines N. Mehmood, L. Zhang and J. Khan	234
Characteristics of the Lateral Shift at the Surface of the Metamaterial	
B. Liu, Q.Y. Shen, J.M. Ye, Z.Q. Xie and M.Y. Xu	238
Loop Transparency for Scalable Dynamic Symbolic Execution X.L. Ji, X.S. Zhang, T. Chen, X.S. Li and L. Jiang	242
Approximate Solutions of Generalized Fifth-Order Korteweg-De Vries (KdV) Equation by	
the Standard Truncated Expansion Method J.L. Wu and W.R. Yang	246
Study on the Error of the Three-Dimensional Structure Light Measurement Based on	240
Triangulation Principle	
Y.M. Tang, X.C. Zhang and T. Liang	251
A Rotor Fault Feature Extraction Method Based on the Hilbert Marginal Spectrum J.W. Wang and F. Zou	255
Design and Calculation Method for the Floors of Heavy-Duty Garages	259
G.Z. Zhang and H.F. Li Isomorphism Identification of Planar Kinematic Chains Based on Characteristic Arrays	239
and Computation	
Y.Q. Shen, C.Y. Wu, S.F. Xu and L. Zhang	263
Computer Aided Design on Thin-Film Evaporator in Parametric Drawing Y. Jiang and J. Liu	267
Calculation on Rotation Stiffness of Asymmetrical Right Circular Flexure Hinge	207
J.Y. Shen	271
Application of Virtual Assembly Technology in the Design of Shaper	
F. Gu and X.H. Zheng	275
The Structural Design Research of Bourdon Tube X.Q. Fan, L.X. Zhang, F. Xu, Y.M. Gu, J. Zhang and J.W. Li	279
Application of Particle Swarm Optimization Based on Support Vector Machine in Multi-	_,,
Objective Structure Optimization	202
C.Y. Chang, J.M. Zhai, Q.X. Xia and B. Cai An Improved Pressure Distribution Model of Automotive Wheel's Radial Fatigue	283
J. Meng, P. Zhu, Q.H. Ji and Z. Liu	287
Research on the Weld Line's Reduction of Injection Molding	
F. Shen, Y. Qi and W.F. Peng	292
Static Analysis of Loading Properties of Small-Size Single-Pylon Cable-Stayed Bridge F.L. Li, Y.H. Zhao and S.M. Liu	296
The Application of MATLAB in Welding Image Processing	200
Y.P. Liu, X. Sun and Z.H. Wen Experimental Study of Cyclic Loading Behaviors of Reinforced Concrete Beams	300
Strengthening with Externally Bonded Steel Frame	
L.Y. Pan, C. Chen, S.B. Zhao and C.Y. Li	304

Coal Mine Mobile Refuge Chamber with Square Cross Section Structure Finite Element Analysis	
A.N. Zhang, Y.M. Gu, J.J. Tai, Z.H. Yin, X.Q. Fan and B.H. Zhang	308
Optimization Design for Crushing Mechanism of Double Toggle Jaw Crusher Z.H. Luo and S.H. Li	312
Crampoon Parametrization Design Based on Further Development of SolidWorks X.L. Zeng, B.S. Sun, X.D. Shu, W.F. Peng and P. Sun	317
The Cylindrical Air Spring Suspension Stability Model and Simulation L. Wang, C. Chen, D.J. Yang and R.R. Hu	321
Multi-Objective Topology Optimization Design of a Large Marine Gearbox C. Wei, S.G. Tong, Z.X. Fei and X.M. Lin	325
Design of Online Handwritten Numeral Recognition System Y.F. Chen, J.H. Lin and G.P. Li	329
The Improvement of the Machining Accuracy by Factor Analysis Approach Z.H. Huang and C.R. Jiang	333
A Fast Insulator-Contour-Detection-Algorithm on Power Transmission Lines Images T. Fang, X. Jin, X.L. Hu, P.Z. Wang and C. Dong	337
Study of 3D Reconstruction of Laser Welding Pool Surface Based on Shape from Shading Y.C. Yang and X.D. Gao	344
Study on the Quality and Accuracy of Blanking Workpiece C.L. Liu, W.Y. Shang, W.L. Min, L.Y. Xiao and C.Y. Cheng	348
Extraction of Characteristic Parameters of Keyhole during High Power Fiber Laser Welding	252
Y.H. Liu and X.D. Gao Restoration and Enhancement of X-Ray Images of Molten Pool during Laser Deep Penetration Welding	352
J.B. Xiang and X.D. Gao	356
A Study of a Miniature Modularized Electro-Hydraulic High-Frequency Flutter T. Xing and L. Fu	360
Dynamics Study and Damping Optimization of Circular Saw Based on Numerical Simulation and Experimental Analysis M.H. Yuan, S.G. Tong, Q. Cai and N. Tang	364
An Investigation into the Characteristics of a New High-Frequency Electro-Hydraulic Flutter Device	
D.F. Jin, T. Xing, L. Fu and Y.S. Yang The Book Feilure Mechanism of Air Decked Pleating in Hele Bottom	370
The Rock Failure Mechanism of Air-Decked Blasting in Hole Bottom L. Wu, Y. Zhou and Z.H. Guo	375
Detection of Weld Pool Width during Strong Arc Disturbance Environment L.Z. Jiang and X.D. Gao	379
Study on Surface Temperature Field Simulation and Parameters of EDG Honeycomb Ring Based on ABAQUS	
J. Gao, Q.Y. Liu and X.F. Ma Extraction of Weld Pool Width Feature Based on Visual Sensing during High-Power Fiber	383
Laser Welding Z.Q. Chen and X.D. Gao	388
Corrugated Single Plane Pressure Control System Based on S7-300 J.M. Ye and B. Liu	392
Design and Simulation of Speed Sensorless Control System for Induction Motor H.Y. Wang, Y. Peng and Y. Hou	396
Evaluation of User-Based Collaborative Filtering Algorithms Using Regression Y. Zhang, G.S. Zhou and S. Hua	400
Research on the Matrix Kinetic Sculpture L.L. Yang and Y.H. Wang	405
Current Analysis of Power Devices of the Sub-Module in New Modular Multi-Level Converter	
Y. Xie, B.C. Chen and Y.J. Chen	410
A Watermark Algorithm Based on DCT and M Sequence Scrambling S.J. Qi	414

Aviation Ad Hoc Network Multipath Routing Protocol of Path Segmentation Based G. Yu, J.T. Wang, S.Y. Qian and T.Y. Yang	418
A Driver Model for Direction Control in Intelligent Driving Based on Fuzzy Control L. Chu, J. Chen and Y.B. Wang	422
NINU: An Incremental User-Based Algorithm for Data Sparsity Recommender Systems Y. Zhang, H. Shen and G.S. Zhou	428
Regenerative Braking System Pressure Control Calculation Based on ABS Hydraulic Model L. Chu, J. Chen, L. Yao, C. Chen and J.W. Cai	433
Exploring the Effect of Length and Angle on NACA 0010 for Diffuser Design in Tidal Current Turbines	438
N. Mehmood, L. Zhang and J. Khan PLC Control System of the Stage Loader Based on Step Ladder Instruction X.Q. Chen and G.Z. Cheng	438
The Application and Parameter Optimization of Pascal Curve Gear in the Transplanting Mechanism M.H. Fang	446
Design and Research of Double Outlet Abrasives Forming Machine S.Y. Jin, Y.J. Jia and G.Z. Cheng	450
Power Line Interference Removal Method Based on Unifying Model Blind Separation Algorithm	
L. Chen, L.Y. Zhang and Y.J. Guo	454
Belt Conveyor Electromagnetic Speed Adjustment Technology Y.S. Zhang, H.F. Lin and G.Z. Cheng	458
Studies on Application of Hydraulic Neutron of Injection Molding Machine in Two-Step Demoulding of Large Mould Z.C. Wang, J. Wang and G.F. Li	462
The Sensor-Circuit Design of Bunch and Water Facilities' Monitoring System J.P. Wang	465
The Fault Diagnosis for the Unplanned Downtime of the Roller Disassembly Machine Y.J. Jia, G.Z. Cheng and Y.J. Dai	469
Stability Analysis of the MRT-Based Compliant Polishing Tool System C.Y. Yuan, D. Zheng, J.M. Zhan and L.Y. Hu	473
A Risk-Based Conceptual Design Method for Submarine Rescue Vehicle X.L. Huang and X.B. Huang	477
Experimental Study of Cyclic Loading Behaviors of Impaired Reinforced Concrete Beams Strengthening with Prestressed CFRP Sheets L.Y. Pan, S. Chen, S.B. Zhao and C.Y. Li	483
Forward and Reverse Driving Noise Analysis of HDM Based on Sound Signal H.T. Si, L.J. Liu, X.C. Zhang, F. Li and P.J. Xu	487
Local Laser Bionic Blocking Experimental Study of Hot Work Mould Surface Cracks K.P. Zhao, L.J. Liu, X.C. Zhang, Z.X. Jia, J.Q. Li and W.H. Yang	491
Secondary Developing and Structure Design of Steam Ejector in Parameterized Modelling J. Liu and H.P. Zhang	495
Simulink on Hydraulic System of Engineering Vehicle Z.Y. Qiao and F.Z. Zhao	499
Internal Wave Propagation from Pulsating Sources in a Two-Layer Fluid of Finite Depth D.O. Manyanga and W.Y. Duan	503
A Mathematical Model for Electrostatic Actuators Operation with Multilayer Metallic Strip X.R. Xu, D.Q. Shi, F.Q. Chen and X.Q. Pan	508
Finite Element Analysis of Press Casing of Screw Press S.L. Li and Z.G. Hu	513
Load Tooth Contact Analysis for Double-Crowned Face Gear X.L. Peng, Z.D. Fang and J.K. Jiang	517
A Study of Temperature Measurement Technique of High Intensity Focusing Ultrasonic Therapy	
L. Liu and J. Sun	521
Failure Analysis of Plane Thrust Bearing of Oil Screw Press S.L. Li and Z.G. Hu	525

Design of Ship Abio-Fabric Fireproofing Curtain Equipment Z.Q. Yang, S.H. Chen, C.H. Zhong and X.J. Zhu	529
Fireproofing Performance Research of Water Curtain Z.Q. Yang, S.H. Chen, C.H. Zhong and X.J. Zhu	533
Applying Bond Graphs for Design Representation of Mechatronic Products F.L. Wu, H.B. He and Y.M. Deng	537
Die-Casting Die Design Based on the Application of CAE Simulation Z.X. Jia, N.B. Hu, J.Q. Li, L.J. Liu and L.Q. Chen	541
Study on the Effect of Containment Performance on Iodine Source Term K. Mehboob, X.R. Cao, M. Ali and R. Khan	545
Based on Ant Colony Algorithm Simulation of Single Crystal Alloy Finite Element S. Zhang and L. Meng	549
Based on Immune Algorithm Alloy Tensile Organization Evolution S. Zhang and L. Meng	553
Development of the Pattern Preparing System for Fully Automatic Flat Knitting Machine Which Based on Embedded Technology Z.Y. Zhai and M. Chang	557
The Experimental Study on Modal Parameters Identification for Motorman-HP20 Robot G. Zhang, H.B. Huang and T. Zhang	561
Design of Dynamic Tension Detection System of Multi-Hoisting Wire Rope H.W. Jin and X. Zhang	565
Customization Research on Collaborative Simulation of the Parts of Truck-Mounted Crane A.M. Ji, Z.H. Xu, L.X. Lu and Y.C. Wang	569
Simulation and Optimization of Flexible Hooke Hinge W. Sun	574
Active Compliance Control for the Leg of Hexapod Robot HITCR-II J. Zhao, H. Zhang, Y.B. Liu and Z.W. Zhou	578
An Application of the Analysis and Forecasting Model Based on Time Series – Safety Monitoring of the Reservoir Dams at XiaShan R.L. Hou	582
The Development and Application of Real-Time Monitoring and Forecasting System of Urban Air Quality R.L. Hou	586
The Mold Design for the Mouse Bottom Cover Based on EMX Software H.L. Li and Z.X. Jia	590
Study on Identifying Surface Quality of Work Pieces Based on Texture Analysis W.W. Wang and D. Hu	594
Study of Shells Exterior Surface Flaw Based on CCD Automatic Detection System X.M. Li, A.B. Yu and L.J. Ma	598
Finite Element Analysis of Foundation Settlement of 220kV Transmission Tower with Independent Foundation B. Li, M.J. Jian, D.Q. Zhang and G.C. Zhang	602
Design of a Digital Tower Tilting Measuring Instrument Based on MEMS Sensor T.L. Wang, Y. Dong, J. Shen, K. Leng and H. Meng	608
Research of Analysis on Special Dynamic Factors in Product Project Z.Q. Bu and Z.B. Xie	613
Computer Simulation of Drying Process in Tube Rotary Dryer H.B. He	617
Research on the Dynamic Characteristics of the Ice Cover Based on the Finite Element Method	
K.Y. Yang, G.Y. Zhang and D.X. Zhang Design of Profile Divisor System Based on Dispersional Actuator Armov	621
Design of Braille Display System Based on Piezoelectric Actuator Array X. Liang, G.P. Li and Z.M. Xu	625
Direct Pulse Signal Interpolation for Robot Movement Control Programming in INFORM III Language M.Q. Zhang, J.M. Zhan, L.Y. Hu and X.L. Su	630

Impact Characteristics Study on Electromagnet Magnetic Isolation Ring to Electromagnetic Force	
J.N. Cao, J. Liu and Y. Yang	635
The Design of Dual-Box Pier Anti-Collision Device Based on Rubber Cushion J. Liu, J.N. Cao and B.S. Sun	640
The Structural Design of Friction Energy Dissipation Interceptive Devices with Constant Resistance	
J. Liu and X.L. Qian	645
Structural Optimization Design of Flexible Anti-Collision Device for Bridge J. Liu and Y. Yang	649
Ballonet Polishing of Aspheric Part Based on MRF Torque Servo X.G. Ying, D. Zheng, L.Y. Hu and J.M. Zhan	653
Design and Control on Automobile Crane Torque Limiter L.J. Qiu and J. Yang	657
Design and Analysis of Vehicle Berth J. Yang and L.J. Qiu	661
Derivation of the Kinematic Differential Equation for Bending Characteristics of the Bimorph	
S.M. Hua, X.J. Wang and Y.Q. Wang	665
Vibration Analysis for Pigging of Suspension Pipe Bridge W.M. Wang, S.M. Zhang, S.N. Song and Y. Li	669
Feasibility Study on Forming Hollow Axle with Multi-Wedge Synchrostep by Cross Wedge Rolling B.S. Sun, X.L. Zeng, X.D. Shu, W.F. Peng and P. Sun	673
Research on General Remote Monitoring System for Industrial Equipment D.M. Xu and L.S. Shu	678
Customer Call Response System Based on CTI J.F. Tu	682
Design of a Straightness Measurement Device for the Slider's Motion of the Press X.B. Pan and Y. Pan	686
The Analysis of Initial Welding Defect and Structure Improvement of Converter Loop J.Y. Tong, Z.W. Pan, J.H. Bao, X.R. Xu and T.C. Pan	692
Design and Experiment of Ultrasonic Cleaning for Crops X.W. Zhang, Y.J. Chiu and C.H. Yang	697
The Dynamic Analysis of the Tennis Racket with the Ball Impact in the Different Area Y.J. Chiu and C.H. Yang	701
An Experimental Study on Working State Recognition of Machine Tools T.F. Fang, G.F. Li, L. Wang, H.B. Li and W. Guo	707
Design of a New Device for Household Cleaning W. Wang, G.F. Li, J. Chen and J.D. Ma	711
Study on Dynamic Response Characteristics of Composite Thin-Walled Square Beam Subject to Three-Point Bending	
G.Y. Zhou, X.L. Dong and J. Liu	715
Transient Dynamics Research for Self-Anchored Suspension Bridge B.S. Xing, X.F. Wang, W. Li and N.N. Wang	721
The Technology and Application for 3D Modeling of Bionic Individualized Artificial Bone Outline	
L.J. Yang, Y.M. Qi and L.L. Wang	725
Mechanism of Heat Transfer Enhancement due to Tandem Two Cylinders in Unsteady Flow H. Zhang and G.N. Xi	729
A Random Patch Algorithm Based on Markov Chain H. Xu and X.R. Xu	733
Design of New Fixture for Standardized Cutter K. Deng and N.H. Huang	737
Finite Element Analysis of Load Capacity on Coupling Clamps for Pipe Z.N. Hou, J. Wu, Q. Wang, H.G. Tian, N. Chao and B. Zhou	741

A Forwarding Station Integrated with Optimal Cluster Number Selection in Wireless Sensor Networks	
T.J. Chan, C.M. Chen and T.R. Chen	745
Research on Evaluating Theory and Application to Design of Mechanism Scheme with Uncertain Linguistic Information T.J. Wang and C.Z. Hao	749
A Graph Spectral Smoothing Approach for Point-Based Surface on GPU Y.H. Wang and W.Y. Wu	753
State Monitoring of Lathes Based on Load Current Signal Y.P. Yu, G.L. Yu, H.B. Li and G.F. Li	758
PRO/E Modeling and CFD Analysis of Diesel Engine Port L.F. Zhang, D. Chen and M.W. Liu	763
The Study and Realization of Energy-Aware Routing Algorithm of Wireless Sensor Networks H.Y. Hu and Y.Q. Zhang	767
Research and Design of Automatic Monitoring System for Seedling in Solar Greenhouse Y.Q. Zhang and H.Y. Hu	773
Chapter 2: Product Design and Development	
Research of Constructing Product Project Economics Analysis Model of Dynamic and Static Financial Status	
Z.Q. Bu and Z.B. Xie The Water Sump Cleaning Machine by Vacuum Suction	781
X.X. Zhang, Y.J. Jia and G.Z. Cheng	785
The Research on the Methods of Experience Design W.G. Han and Z.J. Wu	789
Car Styling Perceptual Modeling Based on Fuzzy Rules X.R. Wan, J.M. Che and L. Han	794
Product Family Development Based on a Flexible Product Platform Y.L. Huang, X.D. Dai and Y.T. Xiao	798
Single Hydraulic Prop Disassembly Machine S.Y. Jin, G.Z. Cheng and Y.J. Jia	804
The CAE Simulation of the Printer Cover Panel with Gas-Assisted Injection Molding G.Q. Zhang, M.T. Xie, W.J. Wang and J.Q. Zhai	808
System Optimization on Course Group of Modern Machinery Design Method P.Y. Xi and B. Wang	812
Strength Analysis and Optimum Design of Dynamic Compaction Machinery Boom Q. Cai, S.G. Tong, M.H. Yuan and N. Tang	816
Design of Prestressed Concrete Continuous Rigid Frame Bridge with V-Shape Piers S.B. Zhao, S.M. Liu and X.K. Li	821
Method to Aid Product Innovation by TRIZ, DSM and Patent Knowledge W.G. Lin, L. Hou, R.S. Lai, N. Zhao and Y.M. Wu	825
The Design and Simulation of Vibrate Impact Extrusion Die T. Xing, X.L. Feng and L. Fu	829
Study on a Nearest Neighbor Algorithm for Point Clouds Based on the Space Partition Principle X.C. Zhang, T. Liang, Y.M. Tang and X. Zhang	834
Bionic Design Elements in the Application of Modern Product Design	034
L.Q. Wang	838
Development and Application of Simulation Module for Performance Analysis of Chassis Platform X.B. Ning, P. Xu and B.B. Qiu	842
Structure Optimization Design of Pneumatic-Hydraulic Supercharging Press of Lever Amplifier	848
J.T. Du	848

Researching Knowledge Management and Cultural Innovation of Chinese Traditional Color-Culture for the Purpose of Computer Design	
Y.X. Zhou, X.M. Zhang and Q. Zhang	852
Discusses to Use the Chinese Traditional Color-Culture in the Innovation Design Y.X. Zhou and H.Y. Yang	856
The Safety Design of Electromechanical Products D.H. Zhuang	860
Design of Wearable Upper Limb Orthosis for Training and Rehabilitation without Actuator X. Chen, Y.J. Chiu and D.Z. Chen	864
The Topology Optimization for L-Shape Arm of Motorman-HP20 Robot H.B. Huang and G. Zhang	871
Research of Product Design Strategy Z.B. Xie and Z.Q. Bu	875
Research of Following Strategy of Product Design Z.B. Xie and Z.Q. Bu	879
Research of Role of Mature User in Product Design and Symbol W.W. Jiang and Z.B. Xie	882
Research of Design Method of Product Function Analysis and Combination W.W. Jiang and Z.B. Xie	886
The Research of Humanized Design of Mechanical Equipment J.W. Pan	890
Structural Optimization Design of Anti-Collision Sealing Cylindrical Rubber Cushion J. Liu, B.S. Sun and J.N. Cao	894
Integration of Heterogeneous Product Information for Industrial Cluster J.H. Yu and H.F. Zhan	898
Behavioral Modeling with Node Matching Algorithm for Conceptual Design W.R. Yang and Y.M. Deng	902
Design of a New Piezo-Electric Micro-Gripper Based on Flexible Magnifying Mechanism F.Y. Feng, Y.G. Cui, F. Xue and L.E. Wu	907
Amenity Design of Blackboard Eraser C.Z. Li, Z.C. Xu, L.J. Ruan and X.M. Cheng	912
Parameter Optimization of Compressor Based on an Ant Colony Optimization M.P. Zhong	916
The Investigation on the Influence of Cultural Consideration in Shape Segmentation Y. Wu	920
The World Expo in 2010 by Chinese Building Development Prospects Z.J. Wang	924
Chapter 3: Manufacturing Systems Modeling and Optimization	
Improved Methods of QC for Small and Medium-Sized Manufacturing Enterprises W. Guo, G.F. Li, Y.X. Liu and L.L. Liu	931
Research on Knowledge Resource Allocation Oriented Business Process Modeling L. Chen, H.F. Zhan, J.H. Yu, Z.R. Jiang and C.J. Lei	935
Synchronized Loading and Unloading Containers Method Based on Simultaneous Hatches Operations Y.Y. He and Y.H. Hu	939
An Optimization Approach for Surgery Scheduling under Multi-Resource Constraints J. Yin, W. Xiang and S.F. Chen	943
A DSM-Based Multiple-Domain Modeling of Product Information Z.C. Zhang, X.P. Hu and C.Q. Xi	947
Study on the Responsiveness of Production Load-Equilibrium Based Order Allocation Strategy	
W. Xiang, J. Yin, F.F. Ye and F.S. Song Condition-Based Maintenance Policy under Imperfect Inspection Using Monte-Carlo	951
Simulation E.S. Ge, Q.M. Li and G.Y. Zhang	955

Managing System of Manufacturing Process Based on Resource Optimization Deployment W.L. Peng, Z.B. Qin and W.N. Zhang	959
Design and Optimization for Industrial Engineering Integrated Experimental System J.Q. Rong and L.X. Ding	963
Research on Green Manufacturing Model for Circular Economy J.Q. Rong and L. Ling	967
Study on Optimizing Collaborative Manufacturing Chain F.Q. Cheng and H. Wu	971
Research on Span of Manufacturing Task with Time-Sequence Constraint for Manufacturing Collaborative Alliances H.F. Wang	975
The Retrospects and Prospects of Pure Water Hydraulic Technology F. Xu and L.X. Zhang	979
A New Optimal Algorithm for Multi-Containers Packing Problem Y.L. Wang, H.S. Lu and A.B. Yu	983
Research on Management of Emergency Supplies Reserves For Integrated Military-Civilian Y.L. Li, A.D. Guo and S.J. Luo	987
A Discussion of Building a 3D Model Database and Information Query Plat-Form of Huizhou Traditional Dwellings Decorative Art X. She, H.B. Wang, W.Q. Xiao and Q. Yan	991
A One to Multiple Order Allocation Optimization Model of Horizontal Manufacturing Collaborative Alliance J. Gao	996
FEA Forming Simulation of Thickness Nonliner Blanks J.T. Du	1000
Surgical Scheduling Based on Hybrid Flow-Shop Scheduling G.X. Huang, W. Xiang, C. Li, Q. Zheng, S. Zhou, B.Q. Shen and S.F. Chen	1004
Computer Aided Generation the Assembly Process Files for Virtual Assembly X.H. Zhang, G.H. Dai, F. Xie and X.Y. Dong	1008
Safety Analysis and Decision Making Methodology in Ship Towing System Design X.B. Huang and X.L. Huang	1013
Educational Reform of Importing Chinese Traditional Color Culture into the Design Education after Cultural Innovation X.M. Zhang, Y.X. Zhou and H.Y. Yang	1017
Knowledge Management and the Application of the Chinese Traditional Five-Color Aesthetic	
X.M. Zhang, Y.X. Zhou and X.P. Wu Construction of Die and Mould Technology Innovation Chain Based on Resource Tree	1021
J.F. Tu Die and Mould Technology Transfer in the Environment of Industrial Cluster	1025
J.F. Tu Study on Constructing Efficient Supply Chain Based on Electronic Commerce J.F. Tu and Z.M. Fang	1029 1033
Measurement of Manufacturing System Complexity Based on Key Resources X.B. Ma, G.F. Li, L.L. Liu and Y.H. Liu	1037
Simulation of Near Infrared Spectroscopy for Laser Induced Interstitial Thermotherapy on Tumors	
H. Zhang, G.R. Hua and A.P. Qian Performance Simulation Model in Product Life-Cycle Management	1042
B. Han, G. Liu and H.W. Wang Study on the Application of an Electronic Training System of Marketing Management	1046
Y.Z. Xiong	1051
Study on Coal Chemical Industry Development Technological Route H.P. Zheng, C.C. Zheng and J.X. Shang	1055

Mechanism Research on Multi-Wedge Synchrostep Rolling Asymmetric Shaft-Parts by Cross-Wedge Rolling	1061
L.P. Chen, X.D. Shu, W.F. Peng and B.S. Sun Strain Rules of Cross Wedge Rolling Asymmetric Shaft-Parts Based on the Parity Wedge	1061
Z. Li, X.D. Shu, W.F. Peng and B.S. Sun	1066
Research on the Status and Prospect of the Hollow Shafts Forming Technology in High- Speed Train	1051
S.H. Zheng, W.F. Peng and X.D. Shu Study of Plume Behavior during High-Power Disk Laser Welding	1071
D.Y. You and X.D. Gao	1076
Potentiostatic Dechlorination of Simulated Cast Iron Artifacts W.Z. Ouyang and S.W. Guo	1080
Influence of Process Parameters on Mechanical Properties of Composites Fabricated by VARTM Process	
Z.L. Sun, M.E. Guo, J. Li and G.Q. Luan	1084
Study on Hot Compression of Ti75 Alloy Based on DEFORM-3D J. Fan and L.G. Wang	1088
Machining Efficiency Model Based on the Multiple Regression Theory in Turning Glass Ceramics	
L.J. Ma, A.B. Yu and Y.D. Gong	1092
Experimental Investigation of Polishing Character of Rotating Magnetic Polishing Fluids Z.C. Wang, Z.X. Lu, S.F. Chen and G.F. Li	1096
Electrodeposited Nanocrystalline Nickel Parts J.S. Chen and J.M. Yang	1102
Performance of Reactive Plasma Cladding TiC Particle Reinforced High Chromium Fe-	1102
Based Ceramics Composite Coating L.M. Wang	1106
Forming Limit Prediction of BCC Materials under Non-Proportional Strain-Path by Using Crystal Plasticity	
M. Yang, X.Y. Zhang and H. Wang	1110
Study on Microstructure and Performance of Heat Affected Zone about Friction Forming Hole	
X.C. Xu, X.L. Fu, S.W. Zhang, F. Qiu and F.H. Liu	1117
The Research on the Microstructure Evolution Law of Cross Wedge Rolling Asymmetric Shaft-Parts Based on Parity Wedge W.W. Gong, X.D. Shu, W.F. Peng and B.S. Sun	1121
Analysis of Characteristic of Metal Vapor Plume during High-Power Disc Laser Welding	1121
Q. Wen and X.D. Gao	1126
The Rolling Force Analysis of Closed Ring Rolling High-Neck Flange W.F. Peng, J.J. Liang, X.D. Shu, B.S. Sun and M. Xiao	1130
Research on Welding Technology of the Belt Conveyor Roller	
H.W. Chen and R.J. Wang Classification of Plume Image and Analysis of Welding Stability during High Power Disc	1135
Laser Welding Q. Wen and X.D. Gao	1139
Fuzzy-PID Control of Electronic Controlled Diesel Engine L.Y. Hu, G.S. Feng, S.M. Jia and W. Zhang	1143
A Novel Method of Bonnet Polishing for Aspheric Surface S.J. Sha, L.S. Wang, D. Zheng and W. Han	1147
Study on the Cavity Defects of Low-Pressure Lost Foam Casting for Magnesium Alloy J.Q. Li, Z. Zhao, Z.X. Jia, Y.W. Xu and Z.Y. Liu	1151
The Parameters Optimization for Mold Wear Reduction of the Cross Wedge Rolling T. Zhang, H.B. Huang and X.D. Shu	1155
Analysis of the Material Removal Rate of Nanosecond Laser Ablation of Aluminium Using a Parallel Hatching Mode S.L. Campanelli, N. Contuzzi, G. Casalino and A.D. Ludovico	1159
Study on Influencing Factors of Tooth Forming Quality for Gear Shaft with Cross Wedge	1107
Rolling M.Z. Jin, J.H. Li and F.Q. Ying	1164

Study of High-Speed Plastic Injection Molding and its Mold Structure Characteristics H.L. Li and Z.X. Jia	1170
Vibration Polishing Edge Preparation for Cemented Carbide Inserts J. Wang, H. Wang and A.B. Yu	1174
Influence of Edge Preparation on Cutting Tool Wear G.B. Chai, W. Wang and A.B. Yu	1178
Injection Molding Process Parameter Optimization of Food Tray for Warpage Minimization Based on Moldflow H.B. He and X.W. Zhu	1182
Lathing Processing Dosage Trends Identifying Based on Current Signal T.F. Fang, G.F. Li, M.T. He and X.B. Ma	1186
Optimization of Screw Rolling Ball Process Parameters Based on Orthogonal Test X.Z. Ren, Y.Q. Liu and Y.R. Jin	1190
Research of Porous Ti/HA Bio-Composite Fabricated by Powder Metallurgical Method L.J. Yang, Z.H. Zhang, X.A. Dang, Q.F. Chen and L. Zhou	1194
Cross-Wedge Rolling at Pti Nas Belarus V.Y. Shchukin, G.V. Kozhevnikova and V.V. Petrenko	1198
Texture Segmentation and Contour Extraction of Warp Knitting Jacquard Fabric Image Y. Zhang, Y.C. Tong and J.Z. Yao	1203
Study on the Application of Lean Construction Supply Chain Management in EPC Project Y. Chen	1207