

Table of Contents

Preface and Organizing Committee

Chapter 1: Advanced Processing Technology

Development and Application of Off-Line Simulation Software for Hot Strip Continuous Rolling	
T. Wang, Z.W. Yuan, H. Xiao, X.D. Qi, G.M. Yuan and D.F. Ren	3
Thermal-Mechanical Coupled Numerical Simulation of Heat Pulp Mould	
D.Z. Yang, Z.Y. Zhou, W.J. Cao and Y. He	9
Finite Element Simulation and Numerical Analysis in the Process of Tube Bending	
X.B. Xu, T.K. Xiong, Q. Guan and L.J. Tan	14
Study on the Stability of Fruit Bromelain	
H.Y. Liang, M. Li, M. Shi, A.P. Liao and R.C. Wu	19
Preparation and Ammonia Sensing Properties of PANI-TSA/PA6 Core-Shell Nanofibers by Electrospinning	
Y.J. Pan, X.J. Dong, Q.F. Wei, W.M. Hung, C.Y. Lin, Y.H. Ho and C.T. Hsieh	23
Effect of Microwave Drying on Cure Characteristics of Natural Rubber	
Y.Z. Wang, F.Q. Zhang, M. Chen, H.H. Huang, M.F. Huang and R.Z. Zeng	27
Piezoelectrics-Based Integrated Optical Waveguide for Mach-Zehnder Interferometer as the Modulator in Microwave Photonic Link	
Z.Y. Ye and Z.Y. Wang	31
The Synthesis of Comb-Like Polymeric Prodrugs of 5-Fluorouracil Derivatives	
F. Qiu, H. Yan, L. Wei and Y. Diao	35
Evolution Characteristics of Primary Phase in A356 Al Alloy during Isothermal Holding in Solid-Liquid Phase Region	
Z. Liu, K. Cao, H.B. Xu and M.Y. Huang	39
Remanufacturing Technology Analysis of Construction Machinery and Equipment	
G.F. Tian, Z.S. Zhang, F.Z. Jin and Y.Y. Qiao	43
Study on Antibacterial and Antioxidant Activities of <i>Salicornia herbacea</i> Extracts	
X.H. Yu, Y.Q. Zhang, R. Shao and W. Xu	47
Precision Influence of Sickle-Like Curve of Hot Rolled Strip on Rotary Shear's Cutting	
J.P. Ji, L. Sun and J.W. Li	51
Numerical Simulation Analysis on the Ten Cross Rolls Straightening Process of the Heavy Calibre Seamless Steel Tube	
H.G. Huang, H.P. Zheng, F.S. Du and W.Z. Wang	56
The Effects of Compression Pressure Applied on the Manufacture of Carbon Composite Bipolar Plate for PEMFC by Utilizing Graphite Waste Products	
Y. Sadeli, J.W. Soedarsono, B. Prihandoko and S. Harjanto	60
Prediction of the Position on Solidification End Point of Continuous Caster	
T.S. Tu, H.L. Wang, Z.S. Lei and Z.M. Ren	67
Modification of Fly Ash by Sodium Tetraethylenepentamine-<i>multi</i> Dithiocarbamate and its Removing Performance towards Cu(II)	
L.H. Liu, B. Li, J. Cao and Z.H. Zhou	71
Mechanism and Tendency of Die Erosion in Al-Si Casting Alloy for Permanent Mold Casting Process	
B.H. Kim and S.M. Lee	77
Optimization of Solid State Fermentation Media for Soluble Dietary Fiber Production by <i>Hericium erinaceus</i>	
X.H. Yu, Z.X. Gu, K. Tu, R. Shao and X.J. Jin	81
Phase-Field Numerical Simulation of Pure Free Dendritic Growth Using Wheeler and Karma Model	
Y. Chen, N.M. Xiao, X.H. Kang and D.Z. Li	90
Analysis of Vibrating Natural Frequency of Pressure Pipeline	
T.Y. Hao	98

Contact Performance Study of Modified Spur Bevel Gear Considering Assembly Error P.F. Xu, X.J. Tian and H.Y. Cui	102
Measurement of Carrier Concentration of Si by One Pair of Hot and Cold Needles Y. Zhao and Y.Y. Zhu	107
The Influence of Solidification Condition to the Aluminum Wire Organization Characteristics L.T. Wang, D.W. Xia, D.Z. E, Q.S. Meng and X.L. Sheng	110
Effects of RE on Iron-Phase Morphology in As-Cast Al-7Si-0.3Mg Alloy Containing 1.2%Fe H.Y. Wen, X.M. Fan, B. Ma and G.S. Deng	114
Boolean Operations Algorithm on Triangle Meshes for Modeling Bone Scaffold W.Y. Jin, Y. Yao, W.D. Chen and Q.X. Hu	118
Influence of Geometry in Nanometric Cutting Single-Crystal Copper via MD Simulation H.W. Zhao, L. Zhang, P. Zhang and C.L. Shi	123
Comparative Study on the Impurities Content of Hydrogenated Transformer Oil under Static Condition Y.H. Qian, Y.B. Huang, Q. Fu, H.Y. Wu and Z.S. Zhong	129
Synthesis of Norbornene Derivative Using Diels-Alder Reaction J.S. Park, H.C. Oh, Y.S. Park and J.W. Woo	136
Development and Application of Advanced Coiling Temperature Control System in Hot Strip Mill L.G. Peng, E.Y. Liu, D.H. Zhang, X. Liu and F. Xu	140
Design of a Tribol-Simulator for the High Strength Steel Friction and Wear Investigation in Hot Stamping X.W. Tian, Y.S. Zhang, Z. Wang, H.Q. Li, L. Wang, B. Zhu and L. Jian	147
Calculation of Melting Curve of Aluminum under Pressure through Molecular Dynamics Simulations J.X. Li and Z.Q. Han	151
Fire Hazard Research of Aluminum Cable Joint D.Z. E, C.Z. Zhao, M. Di and D.W. Xia	156
Melt Shearing Process for Recycling of Iron Contaminated Al-Si Alloy by Modification of Harmful Morphology of Intermetallics B.H. Kim and S.M. Lee	160
Development of Software for Calculating Temperature Field by FEM Simulation to Hot Strip Mill D.L. Tang, X. Liu and L.G. Peng	164
Molten Region around the Cavity Generated by a Moving Electron Beam Y.H. Tsai and C.Y. Ho	169
Effect of Solution Treatment on the Microstructure and Reverse Martensitic Transformation Behavior of a Novel Porous CuAlMn Shape Memory Alloy Q.Z. Wang, C.X. Cui, N.J. Yan and Q. Wang	173
Minimum Mould Exit Shell Thickness of Round Blooms for Peritectic Steel Casting L.G. Sun, H.R. Li and J.Q. Zhang	179
Residual Stress Simulation of a Single Bead-on-Plate with Modified High-Cr Ferrite Heat-Resistant Steel X.J. Di, L.L. Wang and Y.C. Liu	184
Self-Assembly Fabrication of the Polymer p-n Junction Film N.D. Tan, Y.L. Zhang, X.W. Fan, N. Asano, M. Toda and K. Olihara	188
The Modeling and Simulation of Mirostrip Bandpass Filter Using ADS W.P. Li, H. Luo and X.H. Guan	192
The Design of a New Type Oblique Suspended Elevator Platform M.W. Hou	196

Chapter 2: Computer Aided Engineering

Optimization for Powertrain Mounting System Based on Theory of Energy Decoupling Y.H. Sun and G.C. Jin	203
Fatigue Life Analysis of Shaking Table's Exciting Beam Based on Finite Element Analysis H.B. Gong, J. Su, D.L. Zhang, L. Wang and X.Y. Wang	208

OptiStruct Application in Optimization Design of Car Cabin Front Suspension Bracket Y.H. Sun, T.C. Yu and Y. Sun	212
Finite Element Analysis of Structural Safety of a Steel TV Tower Y. Sun, X.D. Shu, W.Q. Yang and Q.R. Zhao	217
Structure Topology Optimization of the Spindle Box of a Machining Center Z.L. Zhou, J. Song and M. Cong	225
Creative Design of Mechanism Configuration Based on Genetic Program X.H. Luo, T. Chen, H. Xu and H. Feng	230
The Two Phased Method of Hull Block Assembly Sequence Planning S.P. Qu and Z.H. Jiang	235
Dynamic Simulation for Driver-Tricycle-Road System with Rigid-Flexible Coupling X. Han	240
Cutting Part Research of Machine for Cutting Mulberry Branch Y.H. Sun, R.S. Lai and G.C. Jin	246
Heating Path Generation and Simulation for Ship Plate Steel H. Zhu and X.G. Yang	250
Pile Foundation CAD Software System J.W. Li, X. Chen and B.D. Li	254
Finite Element Simulations of Mechanical Properties of Solid Expandable Tubular Threaded Joint J.B. Zhang, Y.L. Jia and X.H. Lv	258
A Variant Design Method of Assembly Based on Tree Structure H.X. Zhao, F.Y. Liu, Y. Sun and K. Xu	263
Simulation Calculation of Tilting Torque for Mixed Iron Car L.L. Li, G.P. Xu, Y.L. Kang and X.D. Ma	267
Finite Element Analysis of a Brass Cartridge Case Y. Peng	271
Kinematics and Dynamics Simulation Research for Roller Coaster Multi-Body System G.N. Xu, H.J. Xin, F.Y. Lu and M.L. Yang	276
Research on Thermocouple Embedded Position for CC Mould Copper Plate with Different Cooing Water Temperature L.G. Sun, H.R. Li and J.Q. Zhang	281
Kinematic Analysis on Multi-Bar Linkage of Loader Working Device Based on Transformation Theory of Mechanisms F.S. Zhang and G.N. Xu	287
Studies on Modular Design of Milling Planer that Facing Variant Design F.Y. Liu, Y.Z. Yang, Y.R. Deng, K. Xu and Y. Sun	293
Facing the Dynamic Performance of Machine Tools for the Optimization of Column G.D. Lun, Y.C. Liu, P. Yi and Y. Qu	297
Research on Automation of Simulation Analysis L. Zhu and C.J. Wang	304
Study on Optimization of Engine Accessory Bracket Based on Optistruct Y. Wang, H.T. Zhu, L. Xu, J.P. Ji and X.L. Dai	308
Mechanical Bending Simulation of Thin Stainless Steel by Using Isotropic and Orthotropic Properties S. Siwadamrongpong, U. Kitkamthorn and C. Sajjawattana	312
Garbage Crusher Variant Design Based on Parameterization Y.H. Sun, C.G. Yao, K. Xu and G.C. Jin	316
Finite Element Analysis of Marine Diesel Engine Frame G.J. Yuan, J. Sun and J. Luo	320
A CAD/CAM System for Integrated Process of CNC Incremental Forming and 5-Axis Laser Cutting H. Zhu, N. Li and J.L. Bai	325
Introduction of Characteristics and Choice of CNC Machining Cutter X.G. Ruan, Y.C. Wang, D.F. Zhang, H.X. Cao, M. Sun and F.Y. Li	329
Plane Reverse Based on Coordinate Measuring M. Yang, H.Q. Sun and J.H. Cui	334

The Application of Rigid-Flex Coupled Dynamics Simulation in Coal Mining Machine Research and Development Z. Qin and L. Sun	338
Component-Based Modelling and Revising Method for Micro Device Z. Liu and H. Chen	342
Study on Parametric Design & Simulation for Cam-Linkage Reducer Based on Pro/E B.M. Wang and Y.K. Zou	346
Finite Element Simulations of the Sinus Lifting Process C.C. Huang, L.W. Chen, N.M. Yeh, D.F. Wu and Y.C. Chen	350
Simulation Analysis on Engine Radiated Noise C.G. Xia and Z.Y. Zhang	354
Numerical Analysis on Apeature of High-Pressure Water Jet Punching Hole to Preventing Outburst J.Y. Zhang, X.M. Gong and L.W. Guo	360
System Design on 3D Entity Non-Destructive Measurement Method Y. Gan, A.R. Sun and J. Chen	364
Study of the Process of Turbine Blade and Fixture Design Based on UG and ANSYS J.S. Xin	369
Advanced Development Method of the Standard Fixel Library for Computer Aided Fixture Design G.H. Qin, H.Y. Zhu, H.C. Ye and M.D. Zhou	373
R&D of Picking-Up and Clearing Key Parts for the Type 4LQ-1.6 Line Chili Harvesting Machine X.F. Liu, Y.C. Chen and Y.G. Wang	377
A Computer Aided Assembly Sequence Evaluation Method Based on the Fuzzy Theory for the Complex Products L. Zhao, Y. Li and Y.P. Wang	381
The Effect of Flexion Angle and Sagittal Radius on Femorotibial Contact Stresses C.S. Ramesh and C. Shashishekar	388
Computer-Aided Multi-Domain Unified Modeling and Simulation for Aircraft Landing Gear Y.M. Zhu and H.C. Yang	392
Development of CAPP Tools System Based on the Derivative and Retrieved Z.H. Yuan, Z.J. Wang and H.W. Li	397
Reverse Design of Cam Contour Curve Based on BP Neural Network J.W. Li, D. Wang and Y.G. Tang	402
The Research of Network Security Mechanism Based Collaborative Design H. Xiang and M. Li	406
Research on Bias and Linearity Analysis of MEMS Measurement System Based on Minitab J.W. Yu	410
Numerical Simulation of Elongational Flow in Polymer Vane Extruder J.S. Wen, Y.H. Liang and Z.M. Chen	415
Realization of a Prototype System for Point Cloud Data Processing in Reverse Engineering Y. Zhuo, J. Peng and Y.J. Wu	419
Topological Optimization Design of Cistern Stents of the Planomiller Machine Based on Hyperworks F.Y. Liu, Y. Sun and T.C. Yu	423
Analysis on Wet Multi-Disc Brake Based on ABAQUS J.S. Jiang	427
Application Research of Data Warehouse Technology in Integrated Drilling Engineering Design Z.K. Liu, Y.W. Bai and Q. Li	431
The Degradation Regulation and Numerical Simulation of Ammonia Nitrogen in Semi-Aerobic Landfilling Leachate X.R. Pang, Q.F. Huang, X.D. Pang, J. Wang, J. Wang, Q. Liu, G.D. Zhang, W.J. Zhou and H.Y. Tang	436
Optimization of Injection Molding Parameters for Plastic Part Using Taguchi-TOPSIS Method S.C. Yang, F.C. Tsai, T.F. Mao, A.G. Benna and L.Y. Huang	440

Dynamics Analysis of Coupler Base on Spatial 7R Mechanism Y. Xu, S.Y. Duan and Z.Y. Zhang	444
The Research on Risk Assessment of Failure Mode Based on FMADM Theory M.W. Hou	450

Chapter 3: E-Manufacturing, ERP, and Integrated Factory

Three-Dimensional Design and Motion Simulation of the Three-Ring Gear Reducer Y. Li	457
Statistical Process Control Technology Applied in ERP System Y.J. Li and W.X. Ji	461
Fuzzy C-Means Cluster Segmentation Algorithm Based on Bacterial Colony Chemotaxis Y.L. Li and G. Li	465
Research on Dynamic Location Problem Model and Algorithm of Distribution Centers F.T. Cui, Y.H. Li and A.X. Wei	470
Mathematical Model Research of Intelligent Rapid Testing System for Textile Materials Moisture Regain X.G. Yin and W.W. Ge	477
Job-Shop Manufacturing Execution Process Monitoring Technology H.L. Yuan, A.M. Wang and J.F. Lei	483
A Comparison of Cover Coat Methods for Electronic Flexible Printed Circuit (E-FPC) Based on Peeling Strength S. Tantrairatn, P. Pitayachaval, S. Rangklang and J. Srisertpol	489
Design and Simulation of the Drill Groove Squeegee Roller's Profile Z.Z. Wang, L.Z. Cheng, W. Zhang and W.J. Wang	493
Information Network of C-L PLM Based on the Internet of Things Y.S. Luo, Y. Yang, Y.Z. Li and X.J. Wang	499
Numerical Simulation for Optical Crystal Growth by TSSG Method Z.S. Hu, Z.W. Zhu, R.P. Yang, L.J. Wu, H.M. Mao, L.Z. Du and R. Li	503
A Circuit Milling System with Pixel Based Algorithms K. Wang, C.R. Zhang and R.L. Liu	507
Feed Speed Design and Optimization in Radial-Axial Ring Rolling Process by FEM S.B. Liu, K.L. Wang, S.Q. Lu, X. Li and X.J. Dong	513
Numerical Simulation on Residual Stress Generation in the Crack Tip of ASME P92 Steel Y.J. Jiang, H.Y. Jing, L.Y. Xu and L. Zhao	522
The Design and Simulation Test Research of Electrical Mechanical Brake Z.L. Zhang, R.Q. Dai and C.F. Zhou	526
The Reliability Analysis of the Electrical System and the Fire Control System of Certain-Type Armored Vehicle Based on Copula Function Y.C. Dong, S.X. Zhang, L. Zhang, Y.L. Liu and L.H. Yi	532
Research on Construction of E-Intelligence Maintenance System M. Ge and Y.L. Jiao	536
Performance Analysis of a Hyperbolic Flexure Hinge Based on its Closed-Form Equations J.F. Hu, P. Li and X.F. Cui	540
Structural Analysis and Design Optimization of a Selective Laser Sintering System C. Shuai, B. Yang, Y. Nie, H.L. Hu, S.P. Peng and Y. Zhou	544
A Novel Predictive Control Strategy for Supply Chain Management under Networked Manufacturing H. Dong, W.L. Zhao and Y.P. Li	548
Complete Information Dynamic Game Analysis in Tacit Knowledge Sharing Process within Modern Companies J. Fu, Y.H. Li and X.D. Wang	553
Space Contraction and Partition Algorithm for Combinatorial Optimization Y.C. Gao, L.M. Liu, H. Qian and D. Wang	559
A Graph and Matrix Based Approach for Stamping Operation Sequencing for Progressive Die Design C.Y. Chu	564

Realization of NURBS for Cranium in a Laser Sintering Machine J.Y. Zhuang, D.F. Liu, C.D. Gao, H.L. Hu, L. Wang, C. Shuai and S.P. Peng	570
Phase-Field Simulation of Solidification Double Dendritic Growth of Binary Alloy in the Forced Flow W.Y. Long, D.P. You, J.P. Yao and H. Wan	574
Research on Effect Chain Model with Prolog H.H. Su, C.Q. Gao, B. Yang and B. Lv	578
Cost Estimation of Product Life Cycle Z.Q. Ma, T.T. Xu, L. Sun, X.L. Wang, J.M. Fan and A.Q. Sun	582
Research and Design of MES Based on Real-Time Database in Iron & Steel Enterprise L.W. Chen, R. Luo, P. Luo and Q.J. Li	586
Neural Network Based Expert System for Steel Bar Pipeline Fault Diagnosis J. Yin and L.T. Mei	590
The Evaluation of Multi-Supplier Quality Competitiveness Based on TFN-AHP Method Z.T. Xu, X.G. Ming, Z.Y. Wu, W.Y. Song, L.N. He and M. Li	595
An Effective Method for Manufacturing Data Integration Based on Resource Model B.Y. Xu, L.Q. Xie and F.L. Bu	601
Finite Capacity Scheduling - Large System Design R.L. Martin	607
An Optimization Opportunistic Maintenance Policy of Multi-Unit Series Production System W.R. Hou and Z.H. Jiang	617
Research of Complex Plate-Type Cam Processing Based on MasterCAM L. Liu and L. Zhang	625
Studies of Rapid Tooling Spraying Technology Using Low Melting Metal Alloy T.F. Mao, F.C. Tsai, S.C. Yang, D.Y. Yu and J.X. Wang	630
Concurrent Tolerance Design System Based on Manufacturing Context Y.F. Wang, H. Zhang, Y.L. Cao and J.X. Yang	634
Influence of the Blank Contour to Drawing Deformation of the Oil Tank with 304 Strainless Steel Z.Q. Sun, Y.X. Zhang, Y. Li, R.Z. Zhang and Y. Zhong	640
Situation Analysis about Cold-Chain Logistics in China Based on SWOT Analysis Y.J. Hu, L.H. Yao and X. Qiu	644

Chapter 4: Engineering Optimization

Hydrodynamic Integrated Optimization of Two-D Hydrofoil Based on Kriging Model Z.Y. Yang, T. Gao, Y.J. Pang and Y. Ma	651
Reliability Research in Design Stage of CNC System D. Huang	657
An Damping Analysis on Local Vibration in Foundation of ‘four in one’ Nitric Acid Plant S.H. Huang, G.J. Wei and J.C. Feng	661
A New Evaluation Approach to Mechanical Kinematic Concept Using Fuzzy Neural Network J.D. Wu	666
The Application of Car’s Parting Lines in Optimizing Car Styling & Assembly Process W. Lan, M.Y. Sun and F. Fan	670
Gas Analysis Based on Piezoelectric Sensor Array M.M. Tong, L.J. An, S.F. Tang and Z.H. Ren	674
Research on Concept System of Translation Symmetry in Mechanical Systems Z.Y. Ma	679
An Intake Three-Pipeline Model Using Experimental Optimization for a Small Engine C.J. Shih, T.H. Chang and T.L. Teng	683
Optional Design Research of a Composite Wing Based on Sensitivity Analysis L. Yi, H.Q. Hong and Y.L. Li	687
Research of Conceptual Design of Electromechanical Products Based on KBE K. Wang, F. Gao, J. Peng and J. Wang	693

On the Creation and Design Methods of New Chinese Furniture J.F. Xu and H.N. Zhang	699
Study on Fashionable and Preferable Emotion of Men's T-Shirt between Senior Males and Females X.X. Zhang and G.L. Liu	705
Product Innovation and Evaluation Based on TOC and TRIZ W. Huang, L. Hou, N. Zhao and W.G. Lin	709
Study on the Behavior of Reinforced Retaining Wall Under Earthquake Loading Using FEM Analysis L. Jia	713
A Method for Setting the Optimal Production Status Based on Genetic Algorithm in a Discrete Assembly System L. Dong, Z.G. Yan, J. Zhang, K.P. Du and Y.P. Wang	717
The Brake Device Design for Children Two-Wheel Dynamic Scooter X.F. Yi and L.J. He	724
A Probe into the Interesting Design of Products S.C. Chen	728
Collaborative Work Heterogeneous Data Sharing and Application Based on Petri Net Y.P. Hao, H.Q. Huang, P.F. Zeng and W.P. Shao	732
Numerical Simulation of Acoustic Field for the Miniature Cylindrical Transducer with a Rectangular Hole L.L. Yu, J.H. Zhao, Q.Z. Zhao and C. Hui	739
An Error Compensation Method for Structural Responses and Sensitivities X.M. Wu and C. Liu	743
Tool Wear in Sheet Metal Stamping W.Y. Yan, M.P. Pereira and B.F. Rolfe	750
Development of Small-Efficient Tool for Ultrasonic Reactor S. Dai, Y.D. Zhang and P. Zai	754
Structural Parameters Optimization of Excavator Working Device Based on Mining Process T.Z. Sui, L. Wang, Z. Tan and P.C. Jia	759
Conceptual Design for Degreasing Pill Machine Based on TRIZ F. Liu, P. Jiang and R.H. Tan	764
Driving Force and Process Model of Technological System Evolution Y.Q. Dong, H.G. Zhang, J. Zeng, R.H. Tan and F. Yu	770
Decouple Design of Engine Suspension System Vibration S.H. Peng, Y. Wang, L. Xu and X.L. Dai	779
Reverse Analysis for Determining the Stiffness Characteristics of Suspension Spring with Variable Pitch and Wire Diameter J. Ji, Y.W. Li and J.D. Zhao	783
Aerodynamic Power of Geotechnical Centrifuge Y.H. Yin and L.L. Dou	788
Effects of a High Magnetic Field on the Solidification Behavior of Binary Al-Si and Ag-Cu Systems T. Liu, Y. Liu, Q. Wang, Y. Wang, K. Wang and J.C. He	792
The Innovation Design of Electric Forklifts Based on Direct-Drive Equipment Q. Ge and Y. Wang	796
Study on the Natural Vibrations of the Rubber Bearings F. Li, X. Yang, C.G. Shuai, L. He and M. Li	800
Research on Existences and Concept System of Mirror Symmetry in Static Structure of Mechanical Products Z.Y. Ma	806
Research on Environmental Friendly Flootation Agent W.W. Xie, X.W. He, K.W. Huang, Y.R. Zhang and C.K. Liu	810