Table of Contents

Preface and Committees

Chapter 1: Machinery, Equipment, Automation and Control

A New Feed Brace System in Single Reflector Compact Antenna Test Rang H.Y. Luo, L.Q. Tan and D.S. Li	3
Research on Indirect Fault Diagnosis Method of Top Gearbox on Blast Furnace X.L. Zhao, L.X. Gao and J.F. Li	9
EFD Fluid Simulation of Ball Valve on SolidWorks J. Zhang	13
A Fixing Device for Temperature Test of Gas Phase in Cigarette L.Y. Liu, H.R. Li, J.X. Dong, H.M. Luo and J.Y. Cheng	17
Lightweight Study on Gear Reducer Box Structure Based on Finite Element Analysis Y.B. He, B.K. Yang, Y. Zhang, S.W. Liu and D.F. Chen	20
The Tension Calculation of Self-Propelled, Cable-Controlled Vehicles' Cables L. Li, Y.H. Zhang and P. Yang	24
The Dynamic Analysis of Gantry Crane Girder under Lifting Process C.Z. He and W.L. Chen	29
Comparison of Some Existing Model for Throttling Area of Cone Valve X.J. Yuan and K.H. Guo	33
The Analysis of Mechanical-Hydraulic Governor of Diesel Based on the Multi-Body Dynamics with Rigid-Flexible Integration W.D. Zhang, H.D. Wang, Z.M. Liu and G.Y. Ouyang	39
The Analysis and Design of a New Type Wedge Surfaces of Sprag Overrunning Clutch F. Zhang, Z.F. Gao and W.H. Lu	43
The Linear Optimal Control for the Mechanical Vibration Based on Remanufacturing Repaired	
L. Liu The NC Grinding Machine Rebuilding for TG30 NC Lathe P.H. Hou	47 52
The Application of DSP for Controlling Stepper Motor Y. Li and S.K. Cao	58
Research of Reentry Corridor and Guidance Technology for Hypersonic Vehicle X.M. Wang, P. Zhang and C.C. Yao	62
A Dynamic Film Thickness Control System Based on Automatic Wind Ring L. Cai and Y.G. Tan	67
Multifunctional Special Vehicle Design for the Viaduct Maintenance Based on Solidworks R. Zhang, L. Cai, X.H. Zhang and X.L. Peng	72
The Panoramic Vision Simulation System for Loading/Unloading in Container Yard X.B. Liang, W.M. Cheng, J. Qi and J. Dong	76
Servo Control System of NC Modifying Forming Grinding Wheel Based on Cross Coupling Theory	00
H. Lu, S.T. Xie and Y. Wang Modeling and Performance Analysis on a Test Platform for Transmission H. Lu, T. Elsir and G. Wang	80 84
The Analysis on the Application of CAD/CAPP/CAM in Die Designing and Manufacturing H. Zhang, Y.Y. Chen, Z. Chen and P. Tang	88
Analysis on the Application of Pro/E in Die Designing and Die Making Y.Y. Chen, H. Zhang, Z. Chen and P. Tang	92
Analysis of Human-Machine Design of Hand-Grasp Apparatus J.M. Zhang	96
On Application of Bionic Design in the Mini Hair Dryer J.M. Zhang, X. Wu and J. Xu	100

The Application Research on the FANUC Self-Diagnostic System in Processing the Emergency Stop Fault	
J.J. Wang and Q.J. Wu	104
Research on the Taxonomy of Activity Recognition Based on Inertial Sensors Z.M. Xiao, Y.L. Shi, Y. Xue, F. Hu and Y.C. Wu	107
A Hybrid of Back Propagation Neural Network and Genetic Algorithm for Modeling and Simulation of Standard Involute Spur Gear J.L. Luo and X.K. Wang	111
Design of Control System for Wave Compensation Crane Based on Fuzzy Adaptive Method and Motion Prediction Model	111
L. Feng, S.B. Yang, X.F. Zhang, H.B. Huang and J.J. Li	115
Innovative Design of a New Household Multi-Functional Shoe Cabinet W.K. Huang, X.M. Huang, H. Yang, D.S. Liang and Y.J. Zhou	121
Take-Off Motion Planning of Legged Hopping Robot with Redundancy Characteristic Y.B. Li, M.Q. Xu and Y. Wei	127
Evaluation on Across-Wind Response of Tall Building According to Aerodynamic Shapes J.Y. You, K.P. You and Y.M. Kim	131
Fatigue Crack Propagation Experiment and Remaining Fatigue Life Evaluation for Welded Crane Members with Initial Crack Z.Y. Zhao, Z.J. Li, Z.W. Wu and G.T. Shen	137
Research on the Grinding Force of the Basin-Like Grinding Wheel in Grinding Elliptical Grooves of Outer Race	
X.X. Li, J.M. Wang, Y.Q. Sun and Z.G. Gao	143
The Application Research on the Data Protection of the Typical CNC Machine Q.J. Wu and J.J. Wang	149
The Servo Control System of Fabrication System for Optical Fiber Gratings Written Online F. Wu, R.T. Li, B. Pang and C.J. Li	153
A New Discrete Multi-Freedom Modeling Method of Simple Supported Beam Based on MATLAB	157
H.B. Xu, W.G. Zhao, F. Wu, L.W. Wang and R. Gao Precision Temperature Sensor Design	157
Y.J. Meng and H.A. Guo	161
Systematic Evaluation of Influence of Process Parameters on Surface Texture in Flank	
Milling Y. Zhang and X.J. Wan	165
Prediction of Forming Load for the Helical Gear Precision Forging by BP Neural Network W. Feng, J.C. Cao, S.T. Wu and Y.F. Li	170
Aerodynamic Modeling Research of Wind Turbine Suitable for Individual Pitch Control F. Gao	175
Analysis Tire Tread Patterns Noise Based on Wavelet Transform X. Chen and L.J. Chen	180
Innovative Design of a New Water-Saving Greenbelt Cleaning Device Q.Y. Lu, L.Q. Chen and X. Kang	184
Fault Diagnosis of Rolling Bearing Based on Improved Independent Component Analysis and Cepstrum Theory	
P.X. Zhu, G.Y. Jin, Y.Q. Yan and S.Y. Gao	188
A Novel Trajectory Tracking Control Method for a Nonholonomic Mobile Robot with System Uncertainties and Disturbances	102
R.Z. Zhao, X.Z. Zhang, C.H. Shi and W. Chen Crankshaft Composite Lathe's Tool Tip Trajectory Error Analysis and Simulation	193
S.W. Wang, J. Wu, Y.D. Fan, S. Ma and X.B. Gong	199
A Design of Continuous and Universal <i>In Situ</i> Remediation Appliance of Soil Combines Y.F. Li, C. Gong, W.Q. Wang, Y.F. Li and Z.F. Zhou	205
Design of Photocatalytic Reactor with Photocatalyst Film Loaded on Substrate G. Wei and H. Chang	214
Kinematic Optimization of a New High-Speed Press Using a GA-DE Algorithm X.Y. Sun and S.H. Wang	218

Researches on Nonlinear Hybrid Vibration Isolation System L.H. Yang, J.J. Lou and S.J. Zhu	222
Research on the Temperature Compensation Method for Micro Inertial Measurement Unit D. Wang, G.W. Gao, F.W. Cui and Z. Song	228
Research and Implementation of Blade Tip Timing Vibration Monitoring Method Based on Fiber Bragg Magnetic Coupling Sensors F. Wu, X.P. Chen, J. Wang and R.T. Li	232
Optimal Control of Turbine Thermal Fatigue Life L.K. Zheng, Y. Zhou and D.M. Xie	236
A PCOT Monitoring System Based on Virtual Instrument Technology T. Guo, M. Gong, L.X. Nie and G.M. Zhou	241
Research on the Structural Performance of Large-Tonnage Gantry Crane J. Dong, W.M. Cheng, Y.Z. Ren and Y.P. Wang	247
Dynamic Characteristics of a Four-Bar Linkage-Type Continuously Variable Valve Actuation Mechanism Based on ADAMS X.Z. Qu, H. Liu and H. He	251
Study on Design Method of the Double Arc Gear Hobs J. Wu and J.Q. Wang	257
Study on Control Strategy of Nonlinear Systems with Hysteresis Inverse Model Feed- Forward Compensation Based on Preisach X.P. Zong, N. Zhang and P.G. Wang	261
Multiresolution Representation of a Geometric Model for Free-Form Surfaces Turning Based on Mesh Simplification	
Q. Zou, J.F. Lu, Y.J. Gao, T. Wang, J.N. Yao and D.M. Jia Dynamic Modeling and Analysis of Space Manipulator Considering the Flexible of Joint and Link	265
P. Dong, Z. Yang, Z. Yue, W. Cheng and E. Wei	270
Research on Torsional Vibration Analysis of Herringbone Gear Pairs without Groove F. Ren, D.T. Qin and X.L. Wu	276
Speed Control of Linear Feed System Based on Feedforward and Pole Placement Y.B. Shen, J.C. Huang and J. Lin	280
System Identification of Unmanned Planning Boat Rolling Motion Mode W.L. Yang, H.T. Xu, S.L. Yang and S. Zhang	285
Design of Photoionization Detector Based on the Miniature Gas Chromatography S.C. Chai, P. Yang, C.J. Yang, C.L. Cai and N. Yu	291
Error Analysis of the Plane Docking Mechanism Z.J. Xie, Q.Y. Huang and C. Wang	296
Powder Particle Cutting Method and Tool Design L.J. Qiu and S.Y. Xu	300
The Design of Ship Dynamic Positioning Controller Based on Piecewise Control Method H.S. Li, Q. Miao and R.M. Zhou	304
Waste Tire Crushing and Shearing Machine Tools Working Methods of the Gap S.Y. Xu	309
The Intelligent Control System Design of High-Rise Residential Building Lighting Based on PLC D. Li	313
Study of DR/GPS Integrated Navigation on Nonlinear Adaptive Data Fusion Algorithm M.L. Cao and S.M. Yao	317
Multi-Robot Q-Learning over Community Perception Network with Homogeneous Delays L. Jin, Y.Q. Yang, C.B. Ni, Z.Q. Cao and Y.F. Kong	321
Accuracy Analysis of Sensor Array Direction-Finding Crossing for the Sound Location of Burst Point	
J.J. Zong, X.X. Cui, H. Yang, K.P. Yu, Y. Wu, C.F. Lv and Z.B. Hou Laser Far-Field Spot Test System	326
Y.F. Ma	331
Fuzzy Neural Network Controller Based on Hybrid GA-BP Algorithm Y.P. Chen and H.X. Wu	335

Constant Cutting-Power Control of Shearer Based on Neural Network Model Predictive Control	
Y.H. Zhou, H.W. Ma, H.Y. Wu and Y.J. Zhao	340
Research on Kinematics and Trajectory Planning for 6-DOF Industrial Robot Q.P. Zhao, L. Sun, Z.G. Zhu and G.C. Chen	345
Fiber Bragg Grating Sensor for the Research of Water Level Measurement J. Hu, Q.P. Zhu, M.L. Zhao, Z.Y. Leng, T. Cai, K. Wang and J.Y. Liu	349
Research on Portable Field-Testing Device of Infrared Thermal Imager Performance X.D. Gao	354
Design and Research of Intelligent Fire-Fighting Robot L. Cai and R. Zhang	358
The Design of Low Power Consumption Walkie-Talkie W.H. Wei and H. Fang	363
Research on Peak-to-Average Power Ratio for OFDM System H. Fang and W.H. Wei	366
The Simulation of Lane Based on Magnetic Markers Guidance in Laboratory W. Wang	370
Simulation of PFC Algorithm in the System of Tension Control of Shaftless Driven M.T. Huang, Y.J. Zhou and J. Ma	374
Consensus Control for Variable Multi-Agent Systems with Faults and Disturbances Z.Q. Zheng and Z. Weng	378
Design of Temperature Control System Based on DSP and Fuzzy Neural Network Y.J. Chen, Y.H. Zhang and G.W. Ying	384
Design of Detection and Control of Oil Mist Lubricating System Z.X. Yuan and Y.L. Xue	388
Laser Tracking System Design Performance Test C.Y. Wang and Y.B. Wang	392
LQG Control of Across-Wind Response of a Tall Building Y.M. Kim, K.P. You and J.Y. You	396
A High-Precision Binocular Measurement System Y.G. Fu and F.H. Jin	402
Motor Front Axle Temperature Forecasting Based on Phase Space Reconstruction and BP Neural Network M.T. Huang and X.M. Gao	406
Based on STK and Matlab Satellite Formation's Configuration Design and Simulation C.P. Dang, Y.W. Cai, T. Le, Y.B. Zhao and C.J. Xin	411
Applied Research on Segmented-Hilbert-Huang Transform Algorithm in Fault Feature Extraction of Main Reducer	
F.Y. Huang, H.H. Sun, H. Pan and W.R. Zhang Globally Optimal Weighted Fusion White Noise Deconvolution Estimator	417
X.J. Sun Research on the Method of Integration of AIS and Ship Navigation Training Simulation	422
System J.B. Xiao, D.B. Hu and J.H. Hu	428
Study on PID Parameters Tuning Based on Particle Swarm Optimization Y.T. Zhou, J.B. Nie, N. Han, C. Chen and Z.F. Yue	432
Research of Multiple UAVs Task Allocation Based on Improved Contract Net Y.W. Li and B.A. Li	439
Modeling and Realization of CBTC Interlocking System Using SCADE X. Wang and S. Liu	445
Wavelet Algorithm in Rotating Machinery Fault Feature Extraction D.S. Luo and Z. Fan	451
Numerical Simulation on Detecting Defects in Pipes Using T(0,1) Mode Guided Wave L.X. Zhu, Y.M. Wang and F.R. Sun	456
Study on Continuous Measurement of Material Level Based on Dusty Environment such as Ash Storage	<i>A C</i> 1
H.X. Wu and Y.P. Chen	461

Temperature Measurement with CTMU X.Q. Zuo and M.J. Chen	465
Part Parametric Modeling Technology Research Based on Function Module Y.G. Zhang, T.X. Su, W.H. Li, H.P. Mao and Z.M. Guo	469
Design of the Monitoring and Control System for Ozone Production Based on ZigBee Technology H.C. Zhang, H. Wang and Y. Li	473
A Novel GPS/INS Loose Integrated Navigation Algorithm Z.C. Zheng and J. Yue	473
The Study on Multi-Parameter Alarm Algorithm of Water Quality Monitoring Y.J. Zhong and W.S. Zhong	485
The Prediction of the Hot Strip's Width Based on Bayesian Neural Network X.R. Song, Z.H. Hu, X.Q. He and L.P. Tu	489
Chapter 2: Energy, Electrical Engineering and Electronics	
The System Design and Simulation Research of Low Voltage Lockout over Current Protection about Transmission Line	
J.P. Jia	497
Hybrid Forecasting Model of Reactive Load Based on FOA and Linear Exponential Smoothing Y.S. Huang, T. Li and W. Pi	500
Line Selection Device Based on Double Tree Complex Wavelet X. Sun and L. Zhou	505
AC-DC Isolation of EIS Impedance Test System for Li-Ion Battery Packs C.J. Xie, J.B. Liu and H.B. Zhao	509
Study on Fiber Bragg Grating Large Current Sensor X. Wang and J.L. Wang	513
Study and Design on a Three Phase Power Source Based on FPGA Device L. Xiao	517
A Study on the Evaluation of Wind Power Amount Using Air Flow Analysis Results by High-Rise Apartment Building Disposition in the City Center K.P. You, Y.M. Kim and J.Y. You	522
The Control System of High Voltage Electrostatic Precipitator Based on FPGA Z.S. Zhang, P.B. Ge, X.D. Shi, B.F. Liu and Z.Q. Liu	528
Implementation of Alternating Analog Input Board on ARM7 G.B. Huang, H.L. Li and R.L. Li	532
Envelope Signal of Partial Discharge Pattern Recognition Based on Wavelet Packet Transform D.S. Luo and K.P. Chen	536
Research on Self-Propelled Artillery Digital AC Servo System Based on TMS320F2812 L.J. Huang, Z.X. Cheng, H.Y. Zhao and G.S. Wen	541
Study on Detection of Grounding Capacitive Current in Resonance Grounding System M. Yu, H. Lian and P.M. Pan	546
Study on Accuracy of Wind-Power Caused Flicker Estimation M. Wang and Z.D. Yin	550
Temperature of Transformer Controller Based on TMS320C6713 Z.S. Zhang, D. Liu, B.F. Liu, X.D. Shi and Z.Q. Liu	555
The Analysis of Abnormal Phenomena of GEO Satellites Solar Array J.Y. Zhang, J.Y. Wang, W. He, H.L. Bu and Y. Zhang	559
Chapter 3: Industrial Engineering	
Order-Oriented Manufacturing Resource Services Sharing of Building Material and Equipment Enterprise in Cloud Manufacturing	
B.G. Du, S.S. Guo, Y.B. Li and J. Guo	565

IETM Technology is the Development Direction of Engineering Machinery Maintenance J. Zhang, Z.H. Yan and Z.J. Qiang	572
Application of Pro/Engineer in Mobile Front Cover Product Development and Mould Design	
T.X. Li and F. Chen	577
Analysis and Design of Production Management System of Automobile Industry Based on Web	501
X. Luo	581
Pilot Producing Technology Research and Equipment Design of Biogas Purification Compression and Filling	
K. Qin, S. Li, Y.C. Xiao, Z.X. Lu and F.C. Huang	585
Analysis of Driving Force on Reputation Network of Innovational Industrial Cluster Knowledge Transmitting G. Li	589
Reverse Engineering and the Application of Reverse Engineering in Mould Design and	30)
Manufacture	
Z. Chen, C. Zhao, H. Zhang, Y.Y. Chen and P. Tang	594
Disassembly of Products Based on Hybrid Model Plan X.H. Zhang, J. Hu, R. Zhang and X.L. Peng	598
Application of GM (1,1) Model to Production Demand Forecast for Make-to-Stock	376
Enterprise	
M.X. Zeng, W. Ouyang and Z.Q. Zhen	602
Study of Maintenance Mission Requirement Analysis Method Based on FMEA G.Y. Lian, P.C. Yan, K.L. Huang and L.Y. Cai	606
Chapter 4: Other Related Topics	
Bioleaching of Phosphorus from Hematite with Mixed Bacteria	
T. Huang, W.Q. Gong, G.M. Bao and S.M. Lei	613
EigenVoice Used in Speaker Recognition with a few Training Samples H. Li and Y.H. Dong	618
Sequential Multiple Signature Scheme Based on Wavelet Domain Digital Watermarking $\boldsymbol{H}.$ Li and $\boldsymbol{X}.$ Dong	622
Robust Hand Gesture Detection Based on Feature Classifier Z.Q. Zhang and W. Zhu	626
Research on Parallel Algorithm of Sea Surface Oil Spill Identification Based on GPU Y. Zhou, B. Zhou and Y.Y. Gai	631
Process of Baluster for Stone Spiral Staircase Y. Chen	636
Application Analysis of Solar Thermal Conversion Thin Film Materials on the New Energy	030
Vehicles	
X.J. Ruan	640
Research on Hydrogen Absorption Mechanism Modeling of the NdFeB Hydrogen Decrepitation Process	
Q. Li, W.B. Shang, L. Zhu and J.M. Zhao	644
Analysis of Rehabilitation Data by Multi-Dimensional Principal Component Analysis	
Method Using the Statistical Software R A. Ishida, U. Aibara, J. Murakami, N. Yamamoto, S. Saito, T. Izumi and N. Kano	650
The Molecules Simulation of the Diffusion of Polar Fluid in the Nano Channel	. = :
X.N. Liu and Q.Y. Zhang	657
Study of Simulation Test Generation Method Based on Improved Binary Particle Swarm Optimization Algorithm G.Y. Lian, P.C. Yan, J.S. Sun and K.L. Huang	661
Coordinate Signal Control in Urban Traffic of Two-Direction Green Wave Based on	
Genetic BP Neural Network S.J. Lv, C.G. Li, Z.M. Li and Q.K. Zang	665