Table of Contents

Preface and Committees

Chapter 1: Factory Automation and Control Systems, Robotics, Emerging Technologies of Mechatronics

Trajectory Optimization Method for Follow-Up Control of Concrete Pump Truck D.W. Huang, B.Y. Liu and R.W. Zhang	3
Design and Implementation of Voice Control System in Flexible Manufacturing Cell J. Li, T. Xu and N.Y. Shen	9
Surgical Robot Design Development E. Farah and S.G. Liu	14
D-H Parameters and Forward Kinematics Solution for 6D of Surgical Robot E. Farah and S.G. Liu	18
Passive Movement Modeling of a Woodpecker Robot K.Y. Zhang and Y. Xu	23
Experimental Study on Energy Gain of the Solar Collector with Automatic Inclining System in Conditions of Central Europe during Low Solar Potential Periods M. Rimár, I. Čorný, M. Fedák and Š. Kuna	26
Research of Optimal End Guidance Law about Homing UAV S.S. Wan, J. Cao and C. Yan	30
Analysis of Rural Power Distribution Automation Construction Y. Li, X.Y. Tang, X.M. Leng and Y.J. Xu	34
Walking of a Delta Robot in Image Space N. Boonhaijaroen and R. Chancharoen	38
Movable Virtual Wall for Operation of Master-Slave Manipulator Arms N. Ditsariyakul and V. Sangveraphunsiri	45
Grinding Force Control of Polishing Cubic Zirconia Gem by an Automatic Faceting Machine	
C. Kaothong and V. Sangveraphunsiri	52
Study on Kinematics of a Ice-Skater Robot of Passive Wheel Type and its Structure Characteristics	60
F.Y. Lin, J.R. Wang and Y. Wang Substitution Instruction Polet Crawler Obstacle Navigation Platform Complex Environment	60
Substation Inspection Robot Crawler Obstacle-Navigation Platform Complex Environment Research T.B. Wang, H.P. Wang, P. Xiao, Y.Q. Luan and L. Li	65
Research on Structure and Control System of a New High-Rise Building Fire Fighting	
Robot H. Jiang, M.Z. Luo and L. Li	68
The Design and Simulation of Stamping Processing Complete Sets of Control Line System Based on CC-Link Network and SSCNET Fieldbus	00
K. Wang, J.P. Zhou, F.W. Xue, J. Sun and T.S. Zhong	74
Application and Simulation of SVPWM Control Techniques in Three-Phase PV Grid-Connected Inverter	0.1
Y. Xue, Y. Li, J.D. Zhang, J. Lin and J.T. Yang	81
Research on Chlorine Dosing Control Based on Adaptive Generalized Predictive Control P.Z. Xie and X.P. Zhou	89
Twin Elevator Group Optimization Dispatching Based on Genetic Algorithm B. Ding, Q.C. Li, J. Zhang and X.F. Liu	95
Combined Feedback and Feedforward Control for an Inertial Stabilization System K. Malithong and V. Sangveraphunsiri	101
Design of Setting Management System of Relay Protection to Anti-Grade Trip in Coal Mine Based on Serial Communication R. Li, S.Y. Song, Z.G. Ma and Z.M. Kou	109

ARM Distributed Numerical Control System Design Based on CAN-Bus J.Y. Fei, B. Gao and J.Y. Wen	113
LPV Modeling and Performance Analysis of Boiler Drum Using IMC-PI Controller S. Vijayalakshmi and D. Manamalli	117
Characteristics of the Linear Piezoelectric Motor with Semi-Elliptical Stator S.T. Ho and F.J. Hu	122
A Standing Wave Piezoelectric Ultrasonic Motor Using a Single Flexural Vibration Ring Transducer M. Shafik and L. Makombe	126
Application of Intelligent Components Base on Hierarchical Architecture to Baggage Handling System X.X. Lv and C.H. Yang	132
Robust Stability Analysis of Delay-Dependence for a Class of Switched Uncertain Systems with Time Delay C.J. Wang and J.S. Chiou	139
An Improved Initial Alignment Method of Strap-Down Inertial Navigation System on a Swaying Base L.H. Zhu and X.H. Cheng	143
Generating Various Inverse Time over Current Numerical Relays Using Microcontroller for Power System Protection V. Barhate	
An Innovative Tactile Interactive Interface Graphical Display for the Visually Impaired Information Technology Access Applications	149
M. Shafik Fire Supervisory System Design Based on Embedded System L. Zheng, R. He and W.J. Wang	155 161
Collaborated a Two-Master-Slave Manipulator Arm with Force Reflection for Defined Miniature Tasks N. Nuchprayool and V. Sangveraphunsiri	166
A Phase Locked Loop Method for Low Voltage Ride-Through Control in Three-Phase Three-Wire Photovoltaic Grid System B. Ding, G. Zhang, Y.M. Zhang and L. Zhao	174
Screen Printing Equipment Control System Design Based on PLC Y.L. Yuan and H. Cheng	180
Intelligent Solar Tracker S.M. Fahim, M. Ahmed and A.R. Mahbub	184
Distributed Numerical Control Strategy for Error Compensation on CNC Machine Tools S.T. Xiang, M.W. Shen and J.G. Yang	188
Comparison Precision of Oil Film Thickness of a Hydrostatic Bearing by Using Different Controllers under External Load M.C. Shih and J.S. Shie	192
Model Predictive Controller for the Flight Control of Ornithopters A.R. Ridwan, M.M.R. Farazi and K.K. Islam	196
SDRE Based Integrated Roll, Yaw and Pitch Controller Design for 122mm Artillery Rocket M.K. Siddiq, J.C. Fang and W.B. Yu	200
The Functional Design on Fault Recorder of μ C/OS-II-Based Intelligent Substation Y.H. Zhang, W.Q. Hu, S.M. Liu and H.B. Wang	209
Fault Test Equipment of Launcher Control System Based on Embedded System H.L. Li, X.Q. Yang, J.H. Han and D. Wang	216
In-Vehicle Test Equipment of Construction Machinery Operating Status Based on ARM Y.X. Ren, R. Tian, Y. Liu and H. Yang	220
Chapter 2: Motor Control	
Detection and its Application of Real-Time Rotor Position with High-Precision for Switched Reluctance Motor Drive Y. Cai, Y.B. Wen, C.H. Wang, S.X. Fan and W.T. Jiang	227

Design and Implementation of the Motor Position Detection System Based on CAN Bus S.X. Fan, Y. Cai, W.T. Jiang, C.H. Wang and Y.B. Wen	232
Development of Master Control System for Direct-Drive PMSG Wind Turbine Based on ARM Controller	•••
C.X. Wen and L. Wang	236
Analysis for Power System Transient Harmonics Based on Wavelet Packet Transform R.H. Liu, A.Q. Pan and X. Yang	241
The Controller of DFIG Power Fed into the Grid Basing on the Rotor Similar Signal Method	245
T.N. Trong, B.N. Tien, H.N. Thanh and H.N. Hoang	245
Research on Theodolite Auto-Focus Motor Control Technology Based on a Disturbance Observer	250
C.T. Liu, Y. Zhang, Z.X. He and B. Li	250
Chapter 3: Theory and Practice of Fuzzy Systems, Fuzzy Control and Neural Networks	
Admissible Conditions for T-S Fuzzy Descriptor Systems with Non-Differentiable Membership Functions	
P. Lin and G. Hu	259
Robust Adaptive Fuzzy Control for Robot Manipulator with Uncertain Dynamics Y. Chen, Y.J. Bi and J. Gao	267
Robust Adaptive Control Based on Fuzzy Compensation for Ammunition Auto-Loading	
Manipulator Y.F. Li, K.W. Li, Y.T. Pan and B.Q. Guo	271
Fuzzy Decision Method for Selecting Civil Servants C.J. Rao	276
Research on Comprehensive Post-Evaluation of Electric Transmission Project Based on	270
Fuzzy AHP Analysis Method L.X. Zheng	280
Research on Project Risk Management of Power Engineering Based on Fuzzy	
Comprehensive Evaluation Method L.X. Zheng	287
Integrated Design about Guidance and Control in Inversible System of Neural Network J. Cao, C. Yan and J.H. Li	294
Stochastic Resonance in FitzHugh-Nagumo Neural Model	
D.R. Zhou, J.C. Gong and D. Li	298
Chapter 4: Image and Video Processing, Algorithms of Optimization	
Based on IDRISI Remote Sensing Images Land-Use Types of Supervised Classification	
Techniques K. Zhang, H.F. Wang and Z. Li	305
An Opposition-Based Modified Differential Evolution Algorithm for Numerical	303
Optimization Problems H.G. Xia and Q.Z. Wang	309
Surface Reconstruction of Stamping Parts Based on Binocular Stereo Vision H.Y. Xiang, B. Han, J.J. Huang and Z. Li	314
A Mixed Noise Filtering Algorithm for High-Speed Sequence Image Processing Y.Z. Yang, W.L. Liu, N.J. Chen and W. Zhu	318
CU-Track: A Multi-Camera Framework for Real-Time Multi-Object Tracking P. Bamrungthai and V. Sangveraphunsiri	325
The Research on a Rapid Appearance Detection Method for Vertical Polarized Electrolytic	0
Capacitors M. Dai, C.Y. Wang, K. Chen and Z.S. Zhang	333
Solving Multi-Instance Visual Scene Recognition with Classifier Ensemble Based on	
Unsupervised Clustering Y. Wang	338

Hybrid Differential Evolution Harmony Search Algorithm for Power Economic Dispatch Problems H.G. Xia and Q.Z. Wang	345
An Improved Differential Evolution Algorithm for Numerical Optimization Problems H.W. Zhao and H.G. Xia	349
Improved Harmony Search Algorithm with Crossover Operation H.G. Xia and Q.L. Wang	353
Research of Vision Detection System Based on Regional Morphology H.Y. Xiang, J.J. Huang, B. Han and Z. Li	357
Research of Stereo Matching Based on HALCON H.Y. Xiang, Z. Li, J.J. Huang and B. Han	361
Chapter 5: Applied Information Technology	
Based Multimedia Technology in University Teaching Dance Classes and Research Q. Fu	367
Rehabilitation Management System Oriented Cloud Services Integration Technology Y.L. Ma, X.H. Chen, B. Liu and G.F. Zhang	371
Analysis on Building Information-Based Platform in University Health Education Q. Zhou	377
Serial Communication and Data Processing Based on Laboratory Virtual Instrument Engineering Workbench B. Ning, X.S. Wang and W.B. Ma	381
The Submarine Rescue Command Simulation Training Information System Based on the HLA	
P. Hu, Q. Hao and Y. Du Cloud Computing-Based Rehabilitation Services Information System X.H. Chen, Y.L. Ma, G.F. Zhang and B. Liu	385 389
Research on SOM-Based Query Reformulation in Emergency Decision W.D. Huang, Y.Z. Wang and Y.M. Liu	396
Research on Air-to-Air and Air-to-Ground Combat Embedded Training System N. Zhang, X.X. Ma and P.H. Rong	402
Chapter 6: Research and Design of Mechanisms and Machines	
Radiated Noise Source Localization of Hydraulic Excavator Based on Wavelet Packet Analysis	
Q.Q. Zhang, Y.Q. Zhou and L.L. Fan	409
A Comparative Analysis of Inductors with Square and Conical Contours B.K. Khoo, O. Mark and N. Thirumalaiswamy	414
Simulation Research on Head Structure and Rod Components Y.C. Dong, R.Z. Liu, J. Liu and L.X. Xia	418
Comparison on Harmonic Response Analysis of Two Kinds of Air Cooling Fan Bridge Model Q. Qi, J.C. Song, K. Ni and K. Zhang	423
Equation Model of Stabilization of Low Damped Astatic Systems M. Rimár, M. Fedák and Š. Kuna	427
The Structure Dynamic Optimum Design of the Frame for High Speed Conveying Manipulator Based on Sensitivity Analysis	
F.W. Xue, J.P. Zhou, K. Wang and J.Y. Zhan Theoretical Analysis and Experimental Study of a Cantilever Beam-Type Dynamic Vibration Absorber	431
J. Zhao and C.Y. Ma	436
Research on Improving Seal Performance of High Pressure Gas for the Accumulator Y.P. Lu and J.L. Kang	442

Identification Method Based on Multiple Order Correlation Analysis of Arc Surfaced Cam Motion Curve Y.Y. Yao, Y.F. Wang and L.P. Zhao	446
Research on Dynamics Simulation of Moving and Stationary Vibration Screen S.H. Xu, W.C. Cao and L. Zeng	451
Optimal Shape Design for Ultimate Brownie Pan	431
Y. Wei	457
Study on Heat Conduction of Microwave Oven Z.C. Zhang	461
The Optimal Design of Multi-Chip White-Light LEDs for Color Uniformity C.J. Yang, C.S. Huang, J.N. Jeng and P.W. Chen	465
Improved Design of Fragment Dispersion of Forward-Firing Warhead Z.B. Shi, M. Gao and L.J. Han	473
The Stability and the Computed Speed of the Boundary Element Numerical Method for Electric Potential Generated by Oblique Hundred - Needle Electrodes M.C. Zhang, A.L. Wang and F.P. Liu	479
Semantic Annotation and Case-Based Retrieval of Fixture Design Case B. Gao, Y. Yan, H.S. Ding, B. Dong and F.P. Zhang	483
Magnetic Lens Pole Piece Axial Field Distribution Model X.Y. Zhang, Q.L. Dong and Y.J. Cui	488
Research on the Design and Simulation of Photovoltaic Cell Array Simulator Circuit C. Liu, H.R. Zhao and S.B. Shu	494
Seal Analysis and Optimization of Large Diameter Gate Valve Based on ANSYS S.X. Li, L.C. Li and Y.Z. Hou	498
Static Analysis of Double-Edged Rock-Breaking Hob Based on Finite Element C.X. Zhu, W.W. Liu, W. Wang and L.D. Zhu	502
Dynamic Force Analysis of the Non-Backlash Double-Roller Enveloping Hourglass Worm Drive Based on LS-DYNA W.J. Wang, R. He and X.Q. Deng	506
A Review of Methodologies Used for Fault Diagnosis of Gearbox Z.Y. Han, Y.L. Liu, H.Y. Jin and H.Y. Fu	510
On the Hamiltonian Flow of Brake Hamiltonian System D.W. Sun and J.R. Liu	515
Modeling and Workplace Analysis of 3T Cable-Driven Parallel Manipulator L.W. Guan, C.L. Mu and Y.J. Hu	519
Manufacturing Technology Study on Non-Backlash Double-Roller Enveloping Hourglass Worm	
J.G. Wang, R. He, X.Q. Deng and L.X. Ren	524
Type Test and Performance Analysis of the Non-Backlash Double-Roller Enveloping Hourglass Worm Drive	
R. He, J.G. Wang, X.Q. Deng, J.F. Zhang and S.J. Liu Design and Research of Semi-Automatic Tubing Elevator	529
H.H. Hui, M. Zhang and D.Y. Zhu	534
Laser Doppler Vibrometry for Structural Dynamic Characterization of Rotating Machinery P. Castellini, M. Martarelli and E.P. Tomasini	538
The Aerodynamic Attributes and Flight Trajectories of a Tail Fin-Stabilized Projectile C.C. Li, C.S. Tai, C.C. Lai, S.M. Fu and Y.C. Tsai	544
Fault Diagnosis Method of Gear Based on Local Mean Decomposition and Least Squares Support Vector Machine Z. Wan, X.Z. Liao, X. Xiong and Z.R. Li	548
Research on Floating Moment Balancing Mechanism of a Gear Pump's Asymmetric	J 4 0
Floating Plate with a V-Shaped Groove A.L. Wang, X.L. Zhang, X.W. Shan and W. Liu	555
Chapter 7: Vehicle Engineering	

Research on Co-Simulation of Driving Antiskid Control for Electric Drive Wheeled Vehicle Z.L. Liao, Y.L. Yan and C.G. Liu

561

Dynamic Analysis of Diesel Engine Piston Based on Time Spectral Element Method Y.G. Zhang, T.X. Su, W.H. Li, H.P. Mao and N. Zhou	565
Sound Quality Evaluation Control of Car Interior Noise F. Li and Y.Y. Zuo	569
Engine-Generator's Optimized Control Strategy for Electric Drive Armored Vehicle Y. Xiang, X.J. Ma, J.Q. Su, C.G. Liu and X.P. Ji	574
Co-Simulation Research of In-Wheel Motor Drive Vehicle Steering Control X.J. Ma, J.Q. Su, Y. Xiang, X.P. Ji and M.J. Hou	578
Plumpness Analysis of Indicator Diagram for Vehicle Damper X. Xu, Z. Cui and J.C. Zhang	582
The Study on Field Kitchen Vehicle Self-Propelled Dynamotor PTO System X.H. Zhang, H. Yang, S.L. Sheng, Y.J. Li and L.J. Yin	586
Aerodynamic Shape Optimization of a Sedan Based on Approximate Model B. Yang, X.J. Hu, L. Liao, X. Yan, Z.M. Zhao and J. Ye	590
Chapter 8: Fracture Mechanics, Material Science, Tribology and Manufacturing Process	
The Factors to Influence the Friction Stir Welding of Aluminum Casting Semi-Solid Metal Dissimilar Joint between SSM 356 and SSM 6061	
W. Boonchouytan, J. Chatthong, S. Rawangwong, R. Burapa and P. Muangjunburee	597
Stress Intensity Factor of Different Width Plates with Edge Crack M.M. Wang, M. Yan and X.J. Zhu	602
Tapered Roller Bearing and Comprehensive Durability Identification of Ceramic Cutting Materials in Machining Process of Steel 80MoCrV4016 A. Panda, J. Duplák and J. Jurko	606
Roller Bearings and Analytical Expression of Selected Cutting Tools Durability in Machining Process of Steel 80MoCrV4016 A. Panda, J. Duplák, J. Jurko and I. Pandová	610
Study on the Effect of the Microstructure of Steel on Mechanical Property G.Y. Chen, H.M. Liu and Z.W. Chen	614
Simulation for Cutting Force and Temperature in High-Speed Milling of TB6 Titanium Alloy	
D.X. Wu, C.F. Yao, D.H. Zhang and W. Zuo	618
Research on One-Shot Process of Hot Extrusion Forming Technology for Aluminum Alloy Drill Pipe	
J.S. Mao, Y.H. Sun and B.C. Liu	623
The Experiment Improvement of Alloy Power Spraying for Steeling Manufacturing C.N. Wang, W.C. Lin and P.D. Tung	627
Foaming of PPC/Wood Fiber Composite Using Moisture Contained in Wood as Blowing	
Agent L.T. Guan, C.L. Yang, N.X. Yuan and D.W. Xie	631
Spiral Bevel Gears CNC Milled by Disc Cutter with Concave End X.Z. Deng, G.G. Li and B.Y. Wei	636
Research about Jet Flow Mechanism and Flow Field Analysis for Layered Composite Materials	
Y.Y. Yao, R.Y. Zhou and L.P. Zhao Boundary Element Numerical Method for Electric Potential Generated by Eleven-Needle Electrodes in Vacuum	642
F.P. Liu and A.L. Wang Autothermal Reforming of Ethanol for Hydrogen Production: Steady State Modeling	647
C. Wutthithanyawat and N. Srisiriwat	651
Autothermal Reforming of Ethanol for Hydrogen Production: Thermodynamic Analysis N. Srisiriwat and C. Wutthithanyawat	658
The Influence of Cutting Parameters of Turning Process on the Oil Palm Wood Using Carbide Tool	
S. Rawangwong, J. Chatthong and W. Boonchouytan	666

Applications of Mud Pulse MWD/LWD System in Bakken Formation, North Dakota, USA G.Z. Han and C. Ai	672
Research on Transient Temperature Field Modeling and Simulation of Flat End Mill for	
High Speed Milling G.Y. Tan, D.P. Li, D. Chen, Z.Y. Wang and G.H. Li	677
Chapter 9: Product Design, Engineering Management and Organization of Production	
Study on Tacit Collusion and Low-Price Equilibrium in Auctioning Total Permitted Pollution Discharge Capacity C.J. Rao	683
Research on Network Layout of Provincial Highway Emergency Material Reserve Center J. Wang, F. Li and J. Liu	687
A Method to Calculate Carbon Footprint of Processing Sectors Based on Gaussian Mixture Model	
X.P. Liu, Z.S. Liu, D. Xiang, L. Gao, Y. Cui and Y. Liu	692
Research on Generation Coal-Saving Effect of the Tiered Pricing of Residential Electricity under Different Power Generation Structures H.J. Zhang, Z.F. Tan and H. Xu	697
The Impact of the RFID Technology in the Supply Chain S. Lu, X.Y. Wei and Q.S. Lei	702
Methods and Applications of Multi-Attribute Auction in the Fields of Automatic Control and Mechatronic Engineering C.J. Rao	708
The Relationship between Design Concept and Design Psychology J. Sun, Z.Y. Wang and X.Z. Sun	712
Modeling Method of Building Energy Consumption & Conservation X.H. Chen, Y.L. Ma, G.F. Zhang and B. Liu	716
Influencing Factors Analysis of House Prices Based on Multiple Linear Regression C. Wang	722
Optimal Bidding Decision of Bidders in Homogeneous Goods Procurement Z.W. Chen	726
Research on the Usability of Product Design J. Sun, Z.Y. Wang and X.Z. Sun	730
Energy Efficiency Assessment Oriented Building Energy Consumption System Model Y.L. Ma, X.H. Chen, B. Liu and G.F. Zhang	734
A TOPSIS-Based Multi-Criteria Approach to Faculty Recruitment: A Case Study D.K. Behera and A. Sarkar	741