

Table of Contents

Preface, Committees and Reviewers

Chapter 1: Electronics, Optoelectronics Materials and Engineering, Laser Technologies

Study of Built-In Electric Field and Migration of Carries in Thermal/Electric-Field Poled Fused Silica	
Z.Q. Dai, J.Y. Duan, J. Wang, Y. Li and Y.T. Ren	3
Communication Transmission Device Based on New Nano Material	
H.Y. Lin	9
Study of Single-Mode and Multi-Mode Optical Fiber in Integrated Wiring	
X.J. Wang, A.J. Liu, Y.C. Bian and R. Li	13
Calculation of External Resistance of Two Gates' Circuits Connected with Different Loads	
Y.Q. Shan, C.J. Shan, J. Luo, X.P. Li and L. Zhou	18
Study on Output of LD-Pumped Passively Q-Switched Subnanosecond Microlasers	
H.J. Cheng, H.M. Chen and D. Cai	23
Design of TFT LCD Driver with Large-Capacity Memory Based on the MAX-II	
G.J. Zhou, D.J. Lv and S.N. Ni	28
Design of High-Order Chaotic Circuits	
Z.L. Tang and S.M. Yu	33
Study on Multisensor Data Fusion of Ultrasonic Sensor	
B.J. Liu	44
Performance Analysis of Three-Phase Full-Controlled Bridge Rectifier Circuit	
Y. Li	49
Study on Lounge Bridge Mapping Based on 3D Laser Scanning	
Z.J. Wu, Z.M. Xu, Y.S. Shi, Y.F. Zhang, G.Y. Jin and Y.H. Mi	54
Design of Ultrasonic Ranging Circuit Based on STC Microcontroller	
R. Luo and Z.H. Zhang	59
Design of External Memory Based on the C8051F02x Microcomputer	
Z.J. Liu	64

Chapter 2: Photovoltaic and Power Engineering

Design of Dual DC Regulated Power Supply Based on MCU dsPIC30F3011	
Y.Q. Wang and Z.C. Cui	71
Design and Analysis of a Vibration-Based Magnetoelectric Energy Harvesting Device	
Z. Zhang, X.Z. Dai and Y. Wang	75
Resonance Analysis of PCB Power-GND Pairs	
R. Liu and D. Xiao	81
Comprehensive Post-Evaluation Model on Wind Power	
Y.N. Wu, W.J. Chen and Y. Li	86
Research on Transient Process of Uniform Transmission Line	
D.L. Xie and X.S. Chen	93
Impact of DC-Power Connection on the Stray Inductance of Bridge Arm in High-Power Converters	
Y.F. Zhu	98
Power Flow Calculation in Distribution System Considering Different Load Model	
T. Shu and W. Li	103
Main Circuit Parameter Design of Permanent Magnetic Direct-Drive Wind Power Generating System	
W.W. Li and Q.H. Gao	107

Research on Harmonic Current Amplification of Parallel Capacitors in a 6kV Substation Z. Zhang and N. Guo	112
Research and Simulation Analysis on Fault of Marine Integrated Electric Propulsion System P. Cheng, P. Qin and J.H. Li	116
Analysis of Wind Power Industry and Construction of New Industrial Chain Model Y.N. Wu, X.Y. Li and M. Gao	121
Design of Power Quality Monitoring System Based on PV Grid-Connected Inverter D.J. Huang and Y. Yan	126
Measurement and Analysis of the Power Frequency Electric Field under 500kV Transmission Lines Y.Z. Sun, X.Y. Song and C.H. Wang	131
Study on Neutral Point Earthed Method of Green Power System F.G. Li, Y.H. Meng and S.B. Shi	135
Study on Electrical Power EPON System X.F. Xiong, G.L. Wu, B.T. Wang and K.R. Wang	139
Volt-Ampere Characteristics of Bulb Experiment S.Y. Feng	143
Sensitivity Analysis in Transient Rotor Current Model and Control of DFIG during Voltage Sags Y. Wang, Z.C. Zou and X.Y. Xiao	147
A New Approach of PWM Modulation of Improving Low-Frequency Characteristics of Inverter H. Zhang, J. Feng and X.R. Song	153
AC Square-Wave Arc Model and Analysis of Characteristics Waveform J. Chen, K.F. He, Z.J. Zhang and Q. Li	157
Optimization of Photovoltaic Grid-Connected Inverter System X.Q. Wu, Q.P. Li and Y. Li	161
Grid-Connected Photovoltaic System Based on QZSI J. Liu and F. Wu	166
Modeling of Rotary Traveling Wave Ultrasonic Motor Y.Y. Zhao, M. Cai, Y.X. Tang, Z.D. Tang and W.S. Li	171
Comparison of Permanent Magnet Linear Synchronous Motor Characteristics Fed by SPWM Inverter and Sinusoid Voltage Source A.F. Xu, Q. Hu and C.X. Gao	176
Analysis and Suppression of Detent Force in PMLSM H. Li and C.X. Gao	180

Chapter 3: Methodology, Devices and Instruments, Measure and Diagnosis, Evaluation and Testing

Algorithm Design and Implementation of Dynamic Star Simulator X.F. Zhao, G.B. Liu and C.S. Liu	187
Optimal Design of Broadband and Large Dynamic Range IF AGC Circuit M.F. Wang, P. Cao, H.Y. Sun and M.J. Xu	194
Study of Inductance-Coupling-RFID Tag's Quality Factor C.F. Liu, F.G. Yan, D.F. Lu and Y. Mei	198
Study of Analysis Method on Electromagnetic Disturbance for Moving Targets B. Li, F.M. Liu and L.Y. Zhang	202
Research on Composite Detection Algorithm of Ship Attitude Measurement D.J. Xu, X. Chen and F. Shen	207
Research on the Expert System in the Transmitter Monitor L.Y. Jia, J. Zhou and C.H. Xie	212
Information Collection System of Electrical Equipment X.R. Cheng and X.Y. Tang	217

Current Limiting Reactor's Reactance Value Selection Based on Short-Circuit Transient Analysis	
T.Y. Zhao and Y.W. Wang	223
CNC Machine Fault Diagnosis Strategy and Maintenance	
G.X. Fu	228
Research of Radar Controllers' Workload in Fuzzy Synthetic Evaluation Model	
W.Z. Tang	233
Time-Arrival Location of Seismic P-Wave Based on Wavelet Transform	
X.H. Liu	239
USB Storage Device Protection Software	
C.Y. Zhao and W.P. Wang	244
The Modular Design for the Asynchronous Motor Rotating Speed Measurement Based on Slip Signal Detection	
X.L. Zhao	250
Development and Validation of a LC-MS/MS Method	
M. Wang, W.J. Zhou, Q.Y. Zhang and M. Huang	255
2FSK Signal Generator Based on AT89C51 Microcontroller	
X.F. Gao and Y.L. An	260
Study on Mission Environment-Oriented Materiel System	
Y. Shen, J.H. Cao, W. Wu and J.W. Wu	265
Study on Fault Diagnosis of Gear-Box	
X.H. Chen	270
Diesel Engine Fault Diagnosis Based on Rough Sets	
H.X. Pan and J.Y. Tian	276
Simulation Design of Transformer Differential Protection Based on Mat Lab	
H.H. He	282
Fault Location Algorithm of the 10kV Rural Network Based on Power Frequency Communication	
S. Su and B.S. Yan	287
Generating Device Based on Theory of Semiconductor Thermoelectric Generation	
K. Li and H. He	292
Microfluid Permittivity Measurement Based on On-Chip CPW with Finite Metal Thickness	
H. Zou and H.Y. Wang	296
Modeling on Threat Assessment System of Reentry-Course Ballistic Missile	
J.K. Xiao, G. Wang, X.K. Guo and Q. Fu	301
Station Deployment and Signal Filter Design for Performance Evaluation of Indoor Positioning System	
C.Y. Chen and R.C. Hwang	306
Analysis of Thyristor Switched Three-Phase Capacitor	
T.X. Yan, X.L. Xie, X.Y. Chen and P. Niu	311
Health Monitoring and Reinforcement of the Cold and Dry Area Roads and Bridges	
Z.Y. Wang and L.J. Liu	317
Study on Green Gas Data Detection System	
F.Y. Zhang and Y.H. Gao	322

Chapter 4: Mechatronics, Automation, Control, Net and Information Technologies

Design and Implementation of SRM Drive System	
S.J. Song, L.S. Wang and Z.H. Zhang	331
Multi-Channel Stepping Motors Driven Based on SCM	
C.C. Huang, L.H. Sun and L.J. Yu	336
Study on Mobile Remote Control	
P. Wang	341
Implementation of High Accuracy DAC Controller Based on HRPWM in TMS320F2806x	
K. Fan, H. Deng and F. Wang	345

Harmonic Vibration Control Synchronization Simulation for Double Exciting Motors of Single-Mass Nonlinear System	
X.H. Li, W. Zhao and Q.C. Zhao	352
Design on Fuzzy Controller of DC Motors Speed Control Based on DSP	
P.J. Zhang, J.H. Guo, H.J. Ma and H.M. Ma	357
Analysis and Simulation of Low Speed Sensorless Vector Control with Two Current Signal Injection Schemes	
Y.D. Li, B. Zhou, Y. Liu and C.L. Zhao	361
Research on Remote Control Technology	
X.Y. Hua	369
Study on Carrier Frequency Control of AC Servo System Based on SVPWM	
S.X. Zhang	374
Design of Gas On-Line Monitoring System Based on STM32 & Linux	
S.J. Guo and J. Li	379
Design of Obstacle Avoidance and Tracking Robot	
H.B. Liu and Y.J. Dong	384
Study on RFID-Based Intelligent Management System for Vehicles	
S. Xu and W.L. Teng	389
Analysis and Design of Open Remote Monitor and Control System	
X. Chen, H.H. Pi and L.L. Zhou	393
Design of Remote Control System	
F.F. Cheng	397
Design of the PLC-Based Burner Control System	
H.D. Hu, J.X. Diao and S.H. Sun	402
Numerical Control System Based on Permanent Magnet Linear Synchronous Motor	
X.N. Ran	406
Modeling and Motion Simulation of Loader Working Device Based on ProE	
R.S. Wei	410
Numerical Integration Combined Gaussian Quadrature with Shuffled Frog Leaping Algorithm in Manufacturing Engineering	
Z.Z. Lai, D.M. Ge and Y.Y. Zhang	415
Trust Model Based on Reputation Propagation Mechanism in Cloud Manufacturing Environment	
P. Niu, D.J. Zhou and X.L. Xie	420
Research of PID Controller in Manufacturing Engineering	
J.H. Que	424
Design and Implementation of CNC Operator Panel Control Functions Based on CPLD	
H.Q. Zhan and B. Xu	428
Collection and Application of the Discontinuous Energy	
X.L. Yue	433
Research on Adaptive Fuzzy PID Dust Collection System	
Z.Y. Mao, J.S. Zhang and L.X. Zhang	437
Architecture Earthquake Disaster Simulation Based on Three-Dimension GIS Algorithm	
G.L. Pang, D.Q. Chen and M. Huang	441
Design and Error Estimates of Cut Tobacco Feeding by Wind System	
X.Z. Zhou	447
Human Body Motion Capture System Based on Inertia Sensing Technology	
S.A. Li, Y.S. Wang and R.P. Xiang	454
Research of Microwave Detector Signal Automatic Gain Control	
A. Wang	459
Research of Underground Tag's Anti-Collision Algorithm	
Y.G. Chen and Y. Wang	463
A Flame Fringe Detection Algorithm Based on Mahalanobis Distance	
Z. Chen and J.H. Shen	467
Research of Image Recognition and Tracking Algorithm Based on PID Fuzzy Control	
W.X. Jiang, Z.M. Wang and J.F. Luo	472

Fusion of Panchromatic and Multispectral Images Based on the Second Generation Bandedet	
W.D. Zhu, W. Shen and X.R. Tu	478
Research of Navigation Bar Production Based on CSS	
J.Y. Mi	482
Intelligent Industrial Park Based on Internet of Things	
X.F. Guo, Z.Q. Wang and L.Z. Zhao	486
Hydraulic Cylinder Driving Based on Synergetic Control	
Y.Q. Liu, Q. Wu and C.X. Wang	491
Design of Cleaning Robot Autonomous Charging System	
D.Q. Han and J. Li	497
Research on Double-Closed-Loop Control for the Frequency Converters in Parallel Operation	
H. Long, X.J. Li, J.L. Huang and K.F. He	503
Controller Design of 8/6 Switched Reluctance Drive with Fuzzy Control	
C.X. Gao, W. Xin and Y. Lin	507
Design of Embedded Remote Fire Alarm Module	
A.M. Xiong, F.Y. Li and J.W. Wen	511
Design of Data Transfer in Intelligent Building System	
Y.H. Jing	515
Efficient Rescue and Position Scheme Based on CC2431	
Y.L. Huang	520
Research of Embedded Web Server in Manufacturing Engineering	
L.M. Fan	524
Electromagnetic Induction Heating Application in Mining Safety Detection	
G. Zhang, X.G. Yue, J. Yang, J.X. Chen, Z.Q. Zhao and X.L. Xie	528

Chapter 5: Manufacturing and Industry Engineering

Prediction for Matte Grade in the Process of Copper Flash Smelting Based on QPSO-LSSVM	
F.R. Zeng and P. Zhang	535
Design of the NC Software of a Micro Mill Based on LabVIEW	
J.L. Niu, J. Chen and D.H. Chen	541
Fuzzy Penetration Control for TIG Weld Based on Wavelet-Fractal	
L.Q. Zhang, L.L. Zhang and L.H. Huang	545
Application of Synergistic Optimization Method by Maximin Fitness Function Strategy Based Multi-Objective Particle Swarm Optimization Algorithm in Metal Bellows Structural Design	
X.M. Yu, A.L. Qin, J.H. Xue, J.K. Ye and W.J. Zhou	550
The Optimized Design of Duct Net Disposal for Filter-Rods based on Topology Structure	
W. Lv	557
Research on Welding Gig Design	
F.R. Shi	562
Research on Capability Deployment of ASW Systems	
X.Y. Wu and W.J. Zhong	566
An Algorithm Based on PFT for Defect Recognition of X-Ray Steel Rope Cord Conveyor Belt Image	
H.P. Liu, C.Y. Miao and X.G. Li	572
Analysis on Mechanical and Electrical Products	
D. Yang	576
Design of Virtual Machine Tool	
X.J. Xu	581
Water Injection Station Design Based on One-For-Several Rotor VVVF Technique	
Y.R. Chang, S.H. Wang and R.X. He	585