

Table of Contents

Preface

Chapter 1: Advanced Technologies and Researches in Materials Science

Development of Super-Hard Cutter Material H.Y. Feng and X.J. Li	3
Preparation of Conducting PEDOT/PI Films by Depositing Polymerization of EDOT in Liquid Phase M.J. Zhang and J.X. Li	8
Performance of CO₂ Adsorption with MEA-AN Modified Solid Adsorbent X.Y. Zhang, H.Y. Qin, X.X. Zheng, S.H. Yu and W. Wu	13
Microstructure and Properties of As-Cast Cu-20Ni-5Sn Alloy R.Q. Liu, A.Y. Li, L.J. Peng and G.B. Qiu	18
Electrochemical Corrosion Behavior of Cu₁₅Ni₁₀Mn Alloy in NaCl Solution W. Cai, A.Y. Li, P. Xu, Y. Wu, L. Chen, G. Wang and S.L. Yang	23
Optimization on the Preparation of Heat-Resistant Cotton Stalk Bast Fibers Reinforced PLA Composites by Response Surface Analysis C.Y. Wei, Z. Wu, X.T. Xue, Y.Z. Cui and Y.L. Sui	28
Experimental Research on the Physi-Mechanical Performances of Geosynthetics J. Hu, H. Zeng and X.B. Wang	33
Application of Electric Flocculation in Wastewater Treatment X. Zhang and Y.L. Liu	38
Study on the Impact of Two Kinds Modification Methods on the Dimensional Stability of Poplar Z.B. Feng, G.Z. Zou, G. Chen and J.B. Cai	42
Notch Size and Loading Rate on the Tensile Behavior of Woven Fabric Reinforced Flexible Composite with Symmetrical Double Edge Notch Z.X. Wang, J.H. Jiang and N.L. Chen	49
Effect of Injection Molding Parameters on the Mechanical Properties of Long Fiber Reinforced Polypropylene Composites H.H. Song, C.L. Xin and Y.D. He	54
Photodegradation of Aqueous Sodium Carbonate by KNiF₃ Nanoparticles Q.N. Li, Q.H. Yang and H.Y. Shen	59
Luminescent and Photocatalytic Properties of BaCoF₄: Ce³⁺ Synthesized by Reflux Method Y.X. Han, Q.H. Yang and H.Y. Shen	64
The Synthesis and the Thermal Properties of CaZr₄(PO₄)₆ Materials L. Su, W.M. Sui and Y.J. Liu	69
Density and Surface Tension of Bi₂SiO₅ Melts H.W. Guo, Z.X. Mo, X.F. Wang and C.R. Zhu	74
Effect of Cladding Current on the Properties of Ti (CN) Ceramic Coating L. Zhang, J.J. Hao, J.H. Ren, J.C. Li and Y.J. Ma	79
Application of TiAl(CN) Metal Ceramic Coating by Reactive Nitrogen-Arc Cladding on Stubble-Cleaning Cutter L.X. Zhu, J.J. Hao, L. Gao, Y.J. Ma and J.G. Zhao	83
Study on the Corrosion Resistance of Ti(CN) Composites Coating D.D. Li, J.J. Hao, Y.J. Ma, L. Gao and J.G. Zhao	88
Research on Process Optimization and Abrasion Resistance of Plasma Spraying Al₂O₃-13wt%TiO₂ Coating L.J. Wang, J.J. Hao, Y.J. Ma, J.G. Zhao and J.C. Li	92
Axisymmetric General Steady-State Solution for Poroelastic Media B.S. Zhao, G.X. Lu and X. Wu	96
Synthesis of Uniform Spherical Alumina Powders by Homogeneous Precipitation X.J. Xu, X.D. Sun, Y.Q. Liang and W. Qiu	100

Acoustic Emission Test for the Gradual Damage Process of Unidirectional Composites X.T. Fang, W.F. Zhang, D.J. Wang and S.W. Liu	105
Study on Electrical Contact Degradation Behavior of Beryllium Bronze A.A. Zhang, W.F. Zhang, Y.L. Zhang and S.J. Zhao	109
Synthesis of $Y_3Al_{5-x}Fe_xO_{12}$ Nanopowder by the Co-Precipitation Method: Influence of Precipitate Agent M. Zeng and Y.H. Wang	114
The Influence of Heat Treatment on the Properties of Breeding Bio-Container H.Y. Huang, G.F. Wu, E.H. Sun and Z.Z. Chang	119
The Topology Optimization of Ceramic-Resin Composite Structure under Thermal and Mechanical Loads Q. Li, J.H. Zhu, Y.H. Zhang and W.H. Zhang	124
The Fabrication of Fe-Doped TiCoSb Thin Films by Magnetron Sputtering and Rapid Thermal Annealing J. Qin, N.Y. Sun, G.H. Wang, M. Zhang, W.M. Shi and L.J. Wang	129
Composite of TiC-TiB₂ Ceramic with Ti-6Al-4V Alloy Prepared by Combustion Synthesis in Ultrahigh Gravity Field H.L. Cui, Z.M. Zhao and L. Zhang	134
Effects of Ultra-High Gravity Field on the Microstructure and Mechanical Properties of Solidified TiC-TiB₂ Ceramic Prepared by Combustion Synthesis Q. Song, Z.M. Zhao and L. Zhang	139
Fracture Behavior of Solidified TiC-TiB₂ Ceramic Prepared by Combustion Synthesis in Ultra-High Gravity Field H. Zhang, Z.M. Zhao and L. Zhang	144
Effect of Sputtering Conditions on the Microstructures of YNiBi Thin Film G.H. Wang, N.Y. Sun, J. Qin, W.M. Shi and L.J. Wang	149
Study on Glass Fiber Reinforced EP/PSF Insulating and Thermally Conductive Composite Filled with BN Particles F. Xie, S.H. Qi and J.P. Li	153
The Preparation and Characterization of ZAO/TiO₂ Nanotubes Composite Materials Y.L. Liu, X.C. Duan and Y.Y. Liu	157
<i>In Situ</i> Synthesis of TiC-TiB₂ Reinforced Fe-Based Composite Coating by Laser Cladding F. Zhou, H.Y. Yang and L.H. He	162
Absorbing/Shielding Property of Graphite-FeSi by Mechanical Milling Y.G. Xu, L.M. Yuan, J. Cai and D.Y. Zhang	166
The Microstructure of Gradient Composite Bioceramic Coating with Single and Multiple Rare Earth Oxide Fabricated by Wide Band Laser Cladding L.Y. Zhang, Q.B. Liu, P.Z. Jiang and Z. Zhang	171
Preparation and Characterization of Purified Multi-Walled Carbon Nanotubes Filled Conductive Adhesive F. Zhang, S.H. Qi and Y. Zhang	175
A Detection Method for Grinding Surface Residual Stresses on Nanostructured Ceramic Coatings W.X. Liu	179
The Grinding Mechanism of Nanostructured Ceramic Coatings W.X. Liu	183
Research Progress on Organic Additives in the Anodic Oxidation Process of Magnesium and its Alloys W. Zhang	187
Enhancement of Photocatalytic Oxidation Degradation of Methyl Orange by WO₃/TiO₂ Photocatalysts under UV Irradiation H.N. Guan	191
Computer Simulation on Conformation Properties of Polymer Chain L.L. Cui and H.N. Guan	195
Tight-Binding Approximation Calculation on the Electronic Structure of Graphene and Graphene Nanoribbons H.X. Wang, C.L. Yang, Y.Z. Zhu and N.C. Yang	199

RETRACTED: Key Factors for Metal Organic Chemical Vapor Deposition of InGaN Films with High InN Molar Fraction	
Y.H. Liu, F. Wang, W. Zhang, S.Y. Yang, Y.T. Zhang, R. Katayama and T. Matsuoka	204
Effects of Cooling Rate on Microstructure and Properties of Nb-Ti Micro-Alloyed Steel	
X. Li, J. Zhao, X. Yang, J.C. Bao and B.Q. Ning	208
Stable Reduced Graphene Oxide Suspension Modified by PAMAM	
Y.Q. He, F. Wu, D. Wu, Y.L. Zhang, J.P. Gao and J. Yan	213
Study of Casting Self-Colored Liquid Crystalline Solid Films of Hydroxypropyl Cellulose	
Q.X. Zhang, L. Qian, L.X. Wang, S. Stuto and C.Y. Shen	217
Electrochemical Activity of Multilayer Films of Carbon Nanotubes and Redox Polymer	
Y.F. Sha, Y.C. Hu, D.X. Sun, Y.S. Guo and B. Zhang	221
Effects of the Sr/Si Ratio on the Photoluminescence Properties of Sr₃SiO₅:Eu²⁺ Nanophosphors	
L.L. Peng, B.T. Liu, Y. Deng and T. Han	225
Photoluminescent Properties of Na⁺, Bi³⁺ Co-Doped CaWO₄: Eu³⁺ Phosphor for PDPs	
B.T. Liu and L.L. Peng	229
Graphene Oxide Reduced and Dispersed by Polysaccharide	
Y.Q. He, R.Q. Li, D. Wu, Y.L. Zhang, J.P. Gao and J. Yan	233
The Properties of the Al-Doped ZnO Thin Film Prepared by Magnetron Sputtering	
W.H. Huang, G.W. Zhong, L.P. Su and T. Li	237
More than Four Subtypes of Trimeric Hydrogen Bonds in Hydroxyl Halides	
X.D. Liu, X.G. Zheng, D.D. Meng and X.L. Xu	242
Effect of Laser Peening on Residual Stress and Micro-Hardness of TC4 Titanium Alloy	
H.C. Qiao, J.B. Zhao, Y.X. Zhao and L. Li	246
Study on the Adiabatic Temperature of Al-Ti-C Grain Refiner Synthesized by SHS Technique	
Y.L. Li and T.G. Zhou	251
Photocatalytic Degradation of the Tributyltin by Titanium Dioxide Photocatalysts	
Q.H. Li, X. Sun, L. Zhang, N. Guo, X.Q. Zhang and L.H. Dong	258
Oxidation and Storage Properties of Stable-Oxidative-Poly-Si-Fe (SOPSF) Coagulant	
Y. Fu, Y.Z. Wang, Y.Z. Yu, J. Tan and N. Shi	262
Oxidation Behavior of Stable-Oxidative-Poly-Si-Fe (SOPSF) Coagulant	
Y. Fu, Y.Z. Wang, J. Tan, H.L. Li and X.Y. Zhang	266
The Researches on Preparation Techniques of Polysilicate Coagulants from Fly Ash	
Y.X. Zhou, Y.Z. Yu and L.S. Fan	270
The Researches on Preparation of Polysilicate Coagulants from Fly Ash and its Application in Water Treatment	
Y.X. Zhou, Y.Z. Yu and J.T. Wang	274
Mechanism Reduction of Hydrogen Production from Dimethyl Ether Partial Oxidation by Plasma Reforming	
L.J. Song and X.H. Li	278
Experimental Analysis of the Damage Zone around Crack Tip for Rubberlike Materials under Mode-I Fracture Condition	
X.L. Li, X.J. Li, J.B. Sang, Y.H. Qie, Y.P. Tu and C.B. Zhang	283
The Die Design and FEA Analysis of Equal Channel Angular Extrusion	
L.L. Gao and J.Z. Zhang	287
CR/EPDM Blends with Steel Friction and Wear Characteristics under Dry Sliding	
L.H. Zhao, B.L. Xie and L.H. Fan	291
Spectroscopic Analysis of the Plasma in Laser Welding of AZ31 Magnesium Alloy	
X.Y. Gu, H. Li and Y. Gao	296
Electronic Structure and Optical Properties of ZnO with Antisite Defects	
X.J. Xie, W.H. Wang, L.Y. Li, X.G. Luo and Y.H. Cheng	301
Self-Assembly Films on a Screen-Printed Carbon Electrode	
Y.F. Sha, H.J. Lan, Y. Zhang, S.S. Liu and J. Xie	307
Annealing-Induced Transformation of Defects in ZnO Single Crystal and the Effects on the Optical Properties	
W.F. Li and X.Q. Feng	311

Effect of Laser Power on Stability of Laser-Twin-Wire Hybrid Welding Process X.Y. Gu, H. Li and L.J. Li	315
Low Temperature Raman Spectroscopic Study on γ-Cu₂(OH)₃Cl X.D. Liu, D.D. Meng, X.G. Zheng, X.L. Xu and Q.X. Guo	320
3D-Computer Simulation of Physical Transfer Process in Laser Molten Pool B. Yang, X.C. Yang, J.B. Lei and Y.S. Wang	324
A Method to Determine the Fractal Roughness Parameter from Surface Profiles Generated by the WM Function L. Wang and Y. Xiang	329
Numerical Simulation of Flow Field of Inflation Pressure for Large Complex Sulfide Mineral of Low-Tin Flotation Machine M.Z. Hu, B.Z. Wu, J.Q. Chen and J.S. Zeng	333
Study on the Vector Hysteron in Two-Dimensional Preisach-Stoner-Wohlfarth Model D.D. Li, F.G. Liu, Y.J. Li and C.G. Zhang	337
Analysis and Suggestions on Leakage of Boiler Low Temperature Reheater X.X. Xu, Y.T. Feng, H. Ke, X.G. Niu and Q. Wang	341
Experimental Study on Coal Pore Characteristic Based on Cryogenic Liquid Nitrogen Method W.M. Cheng, X.Q. Zhang, R. Zhang and G. Wang	345
Synthesis and Bioactivity of poly N-phenylene-N'-aroylthiourea W.H. Wang, H. Zhong, D.F. Guo and G.Y. Liu	351

Chapter 2: Advances in Mechanical Engineering

Numerical Calculation for Three Dimensional Flow Field of Servo Hydraulic Driving Mechanism M.R. Yu, W.S. Han and G. Wang	357
CNG Car Engine Compression Ratio Optimization and Knock Simulation Analysis Y. Qin, Y. Liu, Y.Z. Feng, G.Y. Liu and G.D. Feng	360
Research on Structure Size of Muffler to the Influence of Acoustic Properties J.K. Li	366
Experimental Study on the Gas-Liquid Two Phase Flow of Air-Assist Boom Spraying M.D. Yan, H.P. Mao and W.D. Jia	371
Numerical Simulation of the Three-Dimensional Turbulent Flow in Roto-Jet Pump F.N. Zhu, D. Liu, X.Y. Yang and C.L. Wang	375
Modal Analysis and the Optimization of the Engine Oil Pan Y.F. Lv, X.Q. Li and M.W. Zuo	379
The Research on the Design of the Vertical Axis Wind Turbine Street Light Pole Z.G. Bian, S.Q. Liu and G.Z. Han	383
Simulation and Optimization of the Nozzle of Low Pressure Saturated Steam Turbine B.C. Liu, C.X. Wang, D.B. Zhou and C.X. Jin	387
Simulation and Test Study on Dynamic Characteristic of Air Spring with Auxiliary Chamber L.Q. Sun, Z.X. Li, X.F. Shen and J.Y. Zhu	391
Nonlinear Analysis of Rotor-Stator-Bearing System Unsteady Oil Film Force G.Z. Liu, Y. Yu and B.C. Wen	395
Water Hammer Characteristic of the Pipeline in Ship Pitch Balance System L.K. Peng, Y.Y. Zhang and L.Q. Yu	400
Improvement and Taper Optimal Design of the Hydraulic Fast Connector H.F. Xiang	406
Modeling and Torsional Vibration Control Based on State Feedback for Electric Vehicle Powertrain Z.M. Zhong and Q. Wei	411
Influences of Initial Forward Speed, Ground Stiffness on Seat-Belt Restraint Effectiveness in Rollover of Engineering Vehicle X.L. Wei, G.Q. Chen, X.Y. Zhang, X.G. Wang and L. Li	418
Matching and Optimization for Powertrain System of Parallel Hybrid Electric Vehicle J.P. Gao, Y.H. Wei, Z.N. Liu and H.B. Qiao	423

Simulation Research of Banded Wedge and Synchronous V Belt Drive Based on ANSYS Workbench	
Y. Wu and X. Zhou	432
Analysis of Turnover Mechanism of the Aluminum Electrolytic Capacitor Assembling Machine	
Z. Zheng, B.Z. Xia, Y.R. Liu and Z.D. Ouyang	438
Finite Element Analysis of Gear Contact on Two-Speed Transmission in Electric Cars	
Q.D. Zeng and F.Z. Tan	443
Optimization Design of Transmission Gears Considering the Noise Factors on the Basis of Weighting Method	
Q.D. Zeng and J.R. Deng	447
Research of the Paver Starting Pressure	
G.H. Nie and P.F. Cheng	451
Vibration Parameters Optimization Experiment on Seeder of Rice Bud-Seed for Field Seedling Raising Based on Virtual Prototyping Technology	
W. Yang, J. Yang, H. Ruan, Z.X. Liang and J.L. Mo	456
Study on the Design of a Preload Adjustable Ultrasonic Vibration Extrusion System	
S.J. Hu, Y.R. Chen, J.B. Hou and Q. Shu	462
A Dynamic Cylindrical Cavity Expansion Model for the Penetration of Confined Concrete Targets	
M. Zhen, Z.G. Jiang and D.Y. Song	467
Structure and Development Trend of the Typical Aluminum Electrolytic Capacitor Assembling Machine	
Z. Zheng, B.Z. Xia, Z.D. Ouyang and Y.R. Liu	472
Research on the Automotive Suspension Based on BP Neural Network	
T.H. Li and H. Pan	478
Research on Cutting Methods for Conical Spiral Blade	
J.Z. Zhang, L. Zhao, F. Fang and F. Yang	482
Structural Design and Mechanism Study of a New Extinguishing Bomb Used in High-Rise	
L. Yang, W.S. He, Q.L. Zhao and Z.G. Jiao	485
Numerical Simulation for Non-Smooth Contact Problem in Mechanical Systems	
H.T. Gao, Y.L. Han, F. Hao and S.Q. Zhu	491
Load Model of Scroll Wrap for Calculation of Bending Fatigue Strength	
H. Zhang	496
Safety CAE Finite Element Calculation for Pressure Cooker of Plateau Field Kitchen Unit	
H. Yang, L.H. Wang, Y.Z. Wang, X.H. Zhang and X.Q. Liu	501
Progress of Pulsed Jet Technology in Study and Application	
J. Li and Y.M. Cao	506
Finite Element Analysis on Protective Airtight Doors of Mine Removable Rescue Capsule	
D.G. Chang, S.M. Li, D.H. Liu, Z.Z. Fei and X.J. Gao	511
Finite Element Analysis on Force Measurement Mechanism	
D.G. Chang, D.H. Liu, S.M. Li, W.X. Qiu and H.T. Zhang	515
Structural Optimization Design of an Aircraft Metal-Composite Wing	
Y.H. Zhang, J.H. Zhu, J.S. Li and W.H. Zhang	519
Collar Length on the Performance of a Nozzle Using Fluidic Counterflow for Thrust Vectoring	
Z.M. Liu, Y.L. Xu and F. Shen	524
Gradual Change Reliability Sensitivity Design for Tool Based on Measured Information	
B.Y. Wang and X.G. Wang	528
Research on Multi-Cup Uniform Flow Gravity Sedimentation Single Well Injection-Production Technique	
G.X. Zheng	534
Numerical Study on Flight Stability of Fin-Stabilized Shell of Small Length-Diameter Ratio and High Aspect Ratio	
F. Zhang, D.Y. Xie, W.J. Ruan and H. Wang	540
Numerical Simulation of Triangle-Arranged Tubular Heat Exchanger	
H. Li and R.H. Hu	546

Research on Simulation Modeling of Corn Granule H. Yan and D. Long	550
CFD Simulation Research of Small Space with Large Temperature Difference Y. Zhang and X.Y. Liu	554
Numerical Stimulation of Hydrodynamic Performance for Twin-Skeg Buoy Tender in Shallow Water Y.J. Wang, S. Huang, F. Feng, Y. Liu, X.J. Li and G. Wang	558
Water Impact Analysis for Aircraft over Sea M. Yao	563
Numerical Computation and Analysis of Heavy Medium Cyclone Turbulence Flow Field Y.M. Xia, Z.Q. Xu and Y.N. Tu	567
Mathematical Model of Klingelnberg Cyclo-Paloid Hypoid Gear J.F. Du, Z.D. Fang, M. Xu, X.L. Zhao and Y.M. Feng	572
Simulation and Optimization of a Permanent Magnet for Small-Sized MRI by Genetic Algorithm Y.Y. Cheng, L. Xia and W. He	577
Simulation of the Induced Electric Fields in the Breast Tissue during MRI Breast Imaging G.S. Tao, L. Xia, M.H. Zhu, X. Li and W.L. Xu	581

Chapter 3: Mechatronics, Control, Measurement and Monitoring: Technologies and Solutions

Research on Performance of a Mercury Continuous Emission Monitoring System T.J. Yang, L. Ke, W. Huang, D.Z. Hua, C.J. Pan and H.J. Ye	589
Design of Glass Flatness Semi-Automatic Detection System L.L. Zhai, G.F. Chen, X. Wei and X.P. Ma	593
Online Biscuit Detection System Based on Machine Vision X. Wei, G.F. Chen, L.L. Zhai and Q.Q. Huang	597
The Application of Single Vector Sensor in Direction Tracing of Water-Entry Object D. Xiao and L.Y. Zhang	601
Application of Rough Set Technology to Control Information System of CFBB M.M. Gao, J. Hou, D.L. Zeng, X.J. Lei, Y.P. Wu and M.S. Zhang	605
Construction of Cruise UAV Simulation System Based on HLA B. Xiao, W.G. Liu and M.Y. Sun	609
Peer-to-Peer Cooperative Positioning between GNSS Receivers Q. Chang, Q. Li, H.T. Hou and X.H. Zeng	614
Design and Implementation of IOT-Based on Remote Atmosphere Quality Supervisory System Y. Wang, R. Hu, H. Deng and F. Wang	621
The Gas Injection Control of CNG Automobile Based on BP Neural Network D.H. Chen, W.F. Cao and T. Zhang	626
Optimal MLAT Tracking Based on Improved Simulation for Airport Surveillance Y. Lu, D.L. He and H. Yao	631
Cigarette Filter Rod Parameter Measure Based on Otsu Image Processing S.B. Yang, L. Jin, L.H. Zhang and S.L. Fu	635
Design and Application of a Flamethrower Robot in Getting Rid of Foreign Matter on Power Transmission Lines G.Z. Zhao, L.D. Wang, W.L. Ni, Y.L. Hua and Y.M. Weng	640
Home Services - Track Transport Robot Control System Design R. Wang, H. Guan and J. Lan	646
Design of Toxic Gas Monitoring System Based on Virtual Technology and WSN Y.X. Song, Y. Feng and X.J. Zhang	650
Using Model Checking to Verify the Logic Module of Flight Control Software S.K. Yang and G.Q. Li	655
The Design of Temperature Control System for Rice Wine Fermentation S.Y. Zhang and X.M. Wang	660

Study of Fuzzy-PID Control in MATLAB for Two-Phase Hybrid Stepping Motor S.Y. Zhang and X.M. Wang	664
Fuzzy Control for Nonlinear Uncertain T-S Fuzzy Systems with Time-Varying Delays Y.M. Li and Y.Y. Li	668
Design of Vehicle Navigation Terminal Interface Based on QT X.W. Han, C.T. Li, X.X. Liu and Y.Z. Sun	674
Time Synchronization in Tandem Hot Strip Line Based on Improved Broadcast Mode J.Z. Cao and D.H. Zhang	679
Design of Condenser Rubber Ball Cleaning Counting System Based on CPLD X.W. Han, Y.Z. Sun, X.X. Liu and C.T. Li	684
Library Temperature and Humidity Remote Control System Based on Micro Controller Unit N. Li and Y.G. Tang	690
Research on PID Neural Network Control System of Temperature for Agricultural Film Unit Y. Feng, M.X. Qiao and S. Zheng	694
Based on the Single Chip Microcomputer Atmega168 Robot Control System Design J.Y. Fei, H. Li and B. Gao	700
Research on Motion Simulation for Robot Based on WebGL A. Demin, T.R. Zhang, H.S. Geng, X. Li and W.S. Wang	704
Application of RFID Technology in Development Smart Home and Traffic System T.Z. Wang and A.D. Zhi	709
Application of Uncertain Information Fusion in Diagnosis Decision of Electronic Equipment J. Luo and Q.B. Deng	715
Open Robot Control Platform Based on LSOA F. Tang, G.S. Rao, Q. Chen and P. Zhang	719
Study on Museum Robot Trajectory Planning Based on the Controlled Path P.C. Li, H. Guan and Y.Y. Wang	727
The Design of Dual-Mode Traffic Lights Control System Based on FPGA Y.Y. Yu, Y.Q. Huang, L. Wang and F.S. Tao	732
Design of a LEGO NXT Two-Wheeled Self-Balanced Robot Based on Inverted Pendulum Model J. Chen and H. Wang	737
Numerical Analysis on Parameters Adjustment of Smoke Control System in a Complicated Underground Commercial Zone D.W. Li and J.Z. Zhang	743
Genetic Algorithm-Based COD Calibration Method Research J.N. Qian, T. Wang, X.P. Lv, Y.L. Tang and X.F. Ye	748
A Bio-Inspired Strategy for Robotic Fish Swimming in Unsteady Flows Z.W. Ma, H. Zhou, G.M. Wang, L.C. Shen and T.J. Hu	754
Output Feedback Control of NCS with Communication Constraints H.Y. Chen, Z.X. Li and P.L. Wang	760
Using RFID Technology and Smart Sensor to Build Smart Home System R. Qiu	767
Design of Intelligent Telemedicine Monitoring Data Transmission Network W. Dong and C.X. Liu	773
A Legible Method for Fluid Cavity Detection in Ultrasound Image D.Q. Guo, H.Y. Yang, Z.J. Zhang and D.C. Liu	777
Minimum Energy Control Based on Vector Parameterization for Four-Wheel Drive Omni-Directional Mobile Robots J.P. Chen, J.B. Wang and Y.M. Yang	784
Feed-Forward Control of Input-Series and Output-Parallel DC Transformer X.J. Zhang and B.G. Wang	791
Research and Design on Vision System of the Mobile Robot X. Ma, R.G. Sun and Y.F. Dong	797
Modeling and Simulation on Temperature Control System of Farm Products Baking Equipment J. Liu, Z.W. Jia and R.X. Guo	801

Research on Intelligent Control System of Active Equalization for Charging Station of Electric Vehicle Z.Y. Zhang	805
The Application of Tolerant Rough Set Neural Network to Fighter Fault Diagnosis G.Q. Sun, H.L. Wang, J. Tao and X.B. Li	809
Design on the System of Equipment Material Support Internet of Things D.H. Zhang, T.N. Wang, X.X. Niu and S.S. Yu	815
Evolving Fault Tolerant System Based on FPGA J.N. Lou and Y. Li	819
The Null Space Based Cooperative Formation Control for UAVs Swarm S.Y. Dong, X.P. Zhu and G.Q. Long	824
The Research and Implementation about AFIS R.M. Yuan	830
Design and Simulation of Fuzzy-PID DC Governor System Based on Mine Hoist Y.X. Wu, C.J. Zhang, H.B. Huo and C.Q. Zhou	834
A Simple and Long-Range Displacement Measurement System Y. Hu, Q.H. Zhao, Y.M. Chen and L. Wang	839
Research on Fault Diagnosis Based on SVM W.L. Li, Z.S. Wang, D.Q. Deng and J. Tang	843
Hardware Design and Realization of Synthetical Altimeter Detecting-Instrument Based on Intellectronics Y.L. Shi, L. Ren, Y. Song and H.X. Yu	847
Research on FBG High Temperature Sensor Used for Strain Monitoring Y.M. Liu, Q.M. Cai and J. Lou	851
Study on Glass Furnace Temperature Dual Control Based on Neural Networks Decoupling Control under WINCC H.M. Yang and L.Q. Zhang	856
Design and Realization of Intelligent LED Fluorescent Lighting Control System J. Zeng	861
A Simple and Rapid Electrochemical Method for Determination of Ascorbic Acid Y.F. Sha, M. Zhao, F. Guo, M. Zhao and M.Q. Yang	866
Friction Torque Measurement of Servo Mount Based on Stribeck Model W. Liu, Y.X. Li and H.R. Meng	870
Applications of Fuzz Comprehensive Evaluation in Display and Control System of Armored Vehicle J.F. Nie, W.P. Liu, J. Yi and W.G. Cao	876
Impact Analysis of Guidance Instrument Error Separation Accuracy on Sampling Rate of Inertial Navigation Equipment W.J. Wang, X.J. Duan and J.B. Zhu	880
DZN2 Automatic Soil Moisture Observation System Based on GPRS Transmission L.Q. Xue and L.M. Ye	887
Research on Fuzzy Pid Control System of Temperatuer for Tertiary Air J.C. Zhang and S.H. Jing	892
Heading Measurement Based on Ultrasonic and Magnetic Compass B.J. Sun and Y. Xu	896
Research on Tower Crane Safety Control System Based on GPRS and U Disk Storage J.Y. Wang, G.J. Fu, D.X. Lin and C. Wang	901
Research on Motion Control of AUV with Hybrid Actuators L. Zhang, D.P. Jiang, S.L. Huang and J.X. Zhao	906
An Intelligence Sliding Mode Controller Based on Nonlinear Disturbance Observer for Rotary Steering Drilling Stabilized Platform Y.T. Zhang and J. Yi	913
Design of Stepper Motor Control System Based on LM3S2110 Y.M. Wang, G.Q. Zhu and X.Y. Qiu	920
Optimization of Hybrid Electric Bus Control Strategy with Hybrid Optimization Algorithm J.P. Gao, Z.N. Liu, Z.J. Guo and Y.H. Wei	924
On Non-Linearities Separate Modeling Method and State Feedback Control Z.X. Han and X.S. Tian	931

Path Planning of Multi-Robot Fish Based on Cooperative Game Model X.L. Jia, X.Q. Yang and Y.S. Deng	940
Backstepping Based Adaptive Control of Magnetic Levitation System W. Zhou and B.B. Liu	945
Action Decision Strategy of Simulation Robot Fish Based on Ant Colony Algorithm X.Q. Yang, X.L. Jia and Y.S. Deng	949
Comprehensive CEP Evaluation Method for Calculating Positioning Precision of Navigation Systems Y.Y. Wang, X.R. Jia, G.L. Yang and Y.M. Wang	955
The Application Research of Coal Seam CO Source Identification Based on the D-S Evidence Conflict F. Nan and Y. Li	961
Vibration Analysis and Control of an Active Power-Train Mount System G.C. Sun, H. Guo and L.X. Xu	966
Used Surface Plasma Wave Measure the Thickness and the Negative Permittivity of Nanometal Film R. Jiang, Z.X. Huang, N.C. Shen and X.M. Liu	971
Research of Face Recognition System Based on TMS320DM642 Z. Liu, J.C. Yuan, S. Mei and X. Shi	975
Constraint and Motion Analysis of a Hybrid Mechanism X.O. Huang, J.F. Liu and Y.Q. Yu	980
A Hybrid Testing Method to the Application of Test Case Generation of the Simulation of CTCs-3 On-Board Subsystem K. Feng and K.C. Li	984
An Improved Software Synchronous Sampling Method in the Electrical Signal Parameters Measurement G.O. Hyon, A.N. Wang and H. Wang	990
Research on the Simulation Model for Lateral Control Channel of FCS Based on PC Q. Li, W. Yang, J. Zhou and X.N. Ye	995
Study on Elliptic Filters in Airborne Gravity Data Processing W. Zhou and T.J. Cai	999
Design of Warehouse Temperature and Humidity Detection System X. Wang, H. Pan and H.Y. Gao	1005
Research of a Novel Full-Digital Control ZVZCS Full-Bridge PWM DC / DC Converter Based on ARM7 G.Y. Qiu	1009
The Technology Study of Direct Torque Control Method for Permanent Magnet Synchronous Motor Y.M. Li, W. Huang, P. Jin and J. Rong	1013
The Technology Study of Vector Control System for Permanent Magnet Synchronous Motor H.B. Huang and Y.Z. Wang	1018
Application of Active Mount Engine Vibration Isolation to Fuzzy Control Systems H. Guo, G.C. Sun and M. Fan	1023
Design and Implementation of the Two Wheel Self-Balancing Car Based on Single Chip Microcomputer of Freescale L.C. Wang, Z.Y. Liang and X.Y. Ding	1028
Design of Fault Diagnosis of Automobile Lights Based on CAN/LIN Bus R. You and W. Sun	1033
The Dividing Precision Measurement of the End-Tooth Plate for Ultra-Precision Gear Machining R.W. Zhai, Y. Ma, K.H. Li and S.Y. Ling	1038
A New Kind of Bi-Directional Three-Port DC-DC Converter for Vehicle Y. Xie and W.G. Luo	1043
Research and Design of MEMS SINS/GPS Integrated Navigation System Based on Adaptive Filter G.W. Zhang, X.Y. Zhang, C.L. Song and T.T. Wang	1048
A Survey of Research and Application of Engine Vibration Control System Actuators G.C. Sun, H. Guo and J. Si	1053

Secondary Development of Siemens CNC System for Large Grinding Machine D.D. Han, S.J. Zhao, H. Jiang and H.Y. Fu	1058
Application of Matlab/Simulink in Hydraulic Proportional System M. Liu and Y. Yao	1062
Bearing Binary Classification Intelligent Diagnosis by Combined Improved EEMD with SVM M.J. Zhang, J. Huang, K. Chai and H. Chen	1066
Research and Realization of the Control Performance in the Electro-Magnetic Gears Transmission System J.N. Huang and Y. Ma	1071
Design and Implementation of Online Photosensitive Turbid Meter J.Y. Wang, X.T. Ye and G.C. Liu	1076
Study on Locating of Focus Surface Position for Aerial Cameras M.Y. Zhou, M. Zhao, F. Guo, M.Q. Yang and W. Han	1080
Application of 3D Laser Scanner on Dike Risk Analysis R. Wang, L. Yang, X. Lou and Y. Zhou	1085
Foresight on Real-Time Monitoring System for Submarine Optical Fiber Cables Based on Fiber Sensing Technology X.M. Fan, Y.J. Wang, G.L. Wang, C. Shu and C.G. Li	1089
Study of Submarine Optical Fiber Cable Detection by Interferometric Synthetic Aperture Sonar C.G. Li, Y.J. Wang, G.L. Wang, X.R. Qiao and J. Chen	1094
Technological Status and Development Trend on Remote Control of LED Intelligent Lighting J. Zhang, H.B. Qin, L. Zheng, Y.Q. Yang and L. Zhou	1099
Experiment Research on Embankment Deform Monitoring Using Distributed Optical Fiber Sensor Y. Zhou, P.Y. Zhu and X.F. Yan	1104
Experiments and Evaluation Based Pixellated CZT Semiconductor Detector M. Shen and Z.L. Tang	1109
Research on the Data Fusion of Wireless Sensor Network Based on Credibility H. Pan and T.H. Li	1113
A Study on Routing Protocol of Wireless Sensor Network L. Sang and D. Long	1116
Design of Remote Monitor System for Rural Domestic Sewage Treatment Y.H. Du, W.Y. Zhang, R.K. Chang, L. Wang and J.C. Zhao	1120
A Study on Data Fusion of Wireless Sensor Networks Security T. Gong and H. Yan	1124
A Panoramic Video Monitoring System Using Low-Altitude UAV Based on Fish-Eye Lens Z.M. Xiong, K. Li, Y. Ding, G. Wan and J.M. Liao	1128
A Lightweight of Cluster-Based Key Management Scheme for Wireless Sensor Networks Y.L. Song and S.G. Cao	1133
An Energy Balanced Clustering Algorithm Based on LEACH Protocol Q. Liao and H. Zhu	1138
Hybrid Approach to Optimize the Cluster Flying Orbit for Fractionated Spacecraft Based on PSO-SQP Algorithm S.H. Wan, J.L. Song, J. Chen and M. Hu	1144
A Study on Reconstructing Temperature Field X. Zhou, W.G. Wu, G.Y. Niu and Q. Wang	1150
Design of Semi Physical Simulation Platform for Autonomous Underwater Vehicle D. Xu, L. Zhang, S. Ma and J.X. Zhao	1155
A Region Localization Algorithm Based on Anchors within Two Hops for Wireless Sensor Networks Y. Sun, G.T. Han and S.H. Li	1162
Images of High Density Resistivity Method in Leakage Detecting of the Watertight Screen at Gushan Open-Pit Mine W.S. Huang, S.J. Cai and W.X. Wang	1167

Using Fuzzy Logic to Adjust Plasma Concentration Based on a Two-Compartment Pharmacokinetic Model	
L. Zhao, X.L. Shi, Y.F. Zhang and Y.J. Liu	1171
Development of Wireless Sensor Network Based on ZigBee and RFID Technology	
J.S. Yuan and J. Zhang	1175
Research of Hybrid Mobile Agent Routing in Wireless Sensor Network	
L.H. Zhang and S.Q. Chen	1181
Probabilistic Transmitting-Based Data Aggregation Scheme for Wireless Sensor Networks	
J.H. Guo and Y.D. Luo	1187
An Approach to Estimating Acceleration Information for Longitudinal Control	
Z.G. Li and H.L. Zhang	1191
Hybrid Modeling Method Based on FSPN for Sensor Networks	
Z.C. Wan, H. Zhou, Y.P. Deng and R. Li	1197
Secure Data Aggregation Research for Wireless Sensor Network	
L.Q. Liu, Y.B. Wang and Q.F. Yan	1205
Environmental Modeling Based on Ultrasonic Ranging	
J.H. Wu, T.D. Qin, H.P. Si, J. Chen, K.Y. Lin and C.B. Zhang	1210

Chapter 4: Energy Industry: Engineering Researches and Management

The Research of Smart Energy Management System	
Q.D. Feng	1219
Multi-Objective Model Research with Clean Energy Technologies in Low Carbon Power Planning	
J.Q. Zhong, Z.G. Lu and K.K. Yan	1223
Multi-Mode Communication Distribution Network Supervisory Terminal Unit Based on Embedded Systems	
G. Yang, L.P. Su, R.L. Zhao and J.S. Wu	1229
Feasibility Study on the Fault Line Selection Method Based on Overall Trend of Zero Sequence Current	
L. Gao and H.C. Shu	1235
Study on Low-NO_x Combustion Technology for Coal-Fired Industrial Boilers	
F. Wang, Y. Liu, G. Tian, H.C. Wang, F. Zhang, C.Z. Lu and T. Yue	1239
The Research of Novel High Voltage Electric Energy Measurement Apparatus Based on Three-Phase Four-Wire Virtual-Ground Theory	
Z.S. Zheng, L.X. Wang, X.W. Chen, W.D. Deng, J.H. Zhang and Q.C. Qu	1245
Optimization of Indirect Air-Cooling System of Power Plants with Incremental Power Generation Method and Coal Consumption Method	
W.Z. Yan and B. Yang	1250
A Method to Calculate the Electric Field and Ion Current Density at Ground Level for HVDC Transmission Lines during Rain Weather	
Z.Z. Long and F. Lu	1254
Design of the Push-Pull Switch Power Supply Based on UC3525A	
Y. Tang and G. Wu	1261
Design of Switch Transformer about the Push-Pull Switch Power Supply	
G. Wu and Y. Tang	1266
The Research of On-Line Monitoring System for High Voltage Transmission Line Based on Wireless Sensor Network	
H. Yan and H.Y. Hu	1271
Design Study of a Small Fuel Generator with Inverter	
L. Wang, W.Y. Zhang, Y.H. Du and J.F. Dong	1275
The Application of ATMEL SAM3 MCU in State Grid Electric Power Collector	
Y.Q. Wang, H. Wang and S. Liu	1280
An Optimal Strategy of Balancing for LiFePO₄ Battery in Battery Energy Storage System	
B. Li, D.M. Yang, J.Z. Liu, M. Chen and Z.G. Lu	1286
Quantitative Voltage Control of Large-Scale Wind Base	
Z.J. Xing, X.Y. Kong and F. Huang	1294

Review on Application of Hybrid Energy Storage Based on Ultracapacitor X.B. Yang, H.M. Li, Z. Jiang, H. Wang and Z.D. Yin	1299
Wind Power Forecasting Based on the BP Neural Network J.D. Mao, X.J. Zhang and J. Li	1303
A New Electric Power Harmonic Detection Scheme C. Wang	1308
Study of the Development Countermeasures for Hebei Province Photovoltaic Power Generation Enterprise Based on the Cost-Benefit Analysis L.X. Dai and P. Feng	1313
DC-Modulated AC/AC Converters L.L. Fang	1317
The Application of Digital Simulation Technology in Ship Power System R.M. Yuan	1326
A Discussion on the Development of LNG Based on Market Concentration of Natural Gas Consumption C.M. Zhang, X.M. Huang, S.N. Peng and C.Y. Liao	1330
A Charger Design for Aircraft Batteries Based on ZVS Phase-Shifted Full-Bridge Soft-Switching Circuit Y.L. Liu and Y. Liu	1334
Sensitivity Analyses of Steam Generator Tube Thickness on Induced-SGTR in SBO Accident J.R. Qiu, C.H. Peng and Y. Guo	1338
Study on Velocity Variation of Primary Air in Power Plants X.S. Yang and J. Yin	1342
Performance Analysis of Self-Cleaning Hard Coating on Insulators after Trial Operation W. Wang, H. Zhang and C. Chen	1346
Laddered Multilevel DC/AC Inverters Used in Solar Panel Energy Systems F.L. Luo	1351
Voltage Sag Evaluation Method of a Real Distribution System Based on a Connection Number Model L. Bai and L. Yu	1363
Power Quality Simulation and Assessment System Based on ADPSS B. Zhang, S.Y. Dai and Y.P. Qin	1367
Research on Stability of Power System with Distributed Generation Synthesis Load Model Y. Liu, Z.A. Zhang, W. Liu and Y.N. Wang	1374
Power Supply Reliability Evaluation Based on the Characteristics Mode of Large-Scale Medium Voltage Distribution Network Y.Y. Cui, D.P. Zhao, W. Liu and Y. Long	1380
A Power Quality Online Monitoring Device Based on PowerPC and DSP Q.Y. Wang, Q.Q. Zhang, G.F. Zhang, Y. Zhang and L.X. Wu	1384
Study on the Bi-Level Optimization Model of Active Distribution Network L. Ma, Y.P. Cui, X.Y. Zhu and L.M. Zhou	1389
Application Research on Natural Frequency Method in Single Terminal Traveling Wave Fault Location L. Gao and H.C. Shu	1393
Coupled Numerical Analysis of Flow-Temperature Field of Marine Generator S.G. Yao, F. Liu and D. Sheng	1397
Chaotic Ant Swarm Based Parameter Estimation of Induction Motor from Manufacturer Data Y.J. Li and Z.Z. Jia	1403
Comparison of Performance of a Diesel Engine Fueled with Soybean Biodiesel J.T. Song and C.H. Zhang	1408
Analysis of HZD Series Single-Phase Transformer Inrush Current Suppression Method G.F. Sun	1412
A New Intelligent Risk Automatic Warning System of Grid Catastrophic Accident L.H. Wang, Y. Zhao and H.Q. Li	1418
Analysis on Unbalance Protection of SCB X.P. Xiong, J.J. Hu and Q. Fu	1423

Preventive Security-Constrained Optimal Power Flow with Constraints Limiting the Number of Beforehand Control Actions	
Y.D. Yang, L. Qi and W. Wei	1429
Research of Smart Meter Massive Data Storage Based on Cloud Computing Platform	
W.T. Li, Y. Zheng, S.B. Liu, Z.Z. Long and Z.C. Li	1434

Chapter 5: Materials and Technologies in Construction

Research on Optimization of Renewal Project Planning System of the Industrial Cities	
L.L. Chen, H.C. Qu and K.P. Huang	1441
Influence of Width of Widened Part in Road Engineering	
J.L. Liu and D.L. Wang	1445
Analysis of Bearing Capacity of New-Type Formwork Support Frame	
Q.D. Zeng and F. Liu	1449
Study on the Regularity of the Influence of Wind Pressure on the Properties of Concrete Carbonation	
J.G. Niu, J.L. Wang and J. Bao	1453
Experimental Study on the Flexural Tensile Properties of Fiber Reinforced Light-Weight Aggregate Concrete	
J.G. Niu, J. Bao and Y.Z. Guo	1458
The Optimization Design and Mechanical Analysis of the Collector	
Z.J. Yang and L.Y. Zhou	1463
Numerical Analysis of Temperature Field of Cup-Shaped Frozen Soil Wall Reinforcement at Shield Shaft	
J. Hu, H. Zeng and X.B. Wang	1467
Test Research on Thermal Conductivities of Silty Clay in Freezing and Thawing Based on Thermal Current Meter Method (TCMM)	
Q.S. Guo, X. Li and M. Li	1472
Directional Fracture Blasting Experimental Study	
H.G. Xie, Z.X. Wang, C. Li and J.H. Zhang	1477
Study on the Calculated Program of Soil Slope Safety Factor	
H.G. Xie, C. Li and R.L. Song	1482
Permanent Deformation Process of Asphalt Concrete Pavement Based on Neural Network Modeling	
F.C. Yin and G.C. Zhou	1486
Study on Influence of Surcharge Preloading on Deformation of Embankment with FEM	
J.Q. Liu and L.W. Chen	1491
Earthquake Damage Prediction System of Buildings Group Based on Damage Factors Method	
M. Huang, L. Zhao and P. Li	1496