

# Table of Contents

## Preface and Conference Organization

## Chapter 1: Sensors and Materials for Sensors, their Applications

<b>Fiber Bragg Grating Hydrogen Sensor Based on Magnetron Sputtering</b> H.B. Wang, Y.T. Luo, F. Li, H.T. Song, Z. Wu and X. Li	3
<b>The Simulated Calculation of Electric Impedance Sensor</b> Q. Li, Y.M. Yang, Z.B. Yuan and J. Lv	7
<b>Fiber Bragg Grating Hydrogen Sensor Applied for Partial Discharge Detection in Transformer Oil</b> Y.T. Luo, H.B. Wang, W.J. Zhu, Z. Wu, H.T. Song and X. Li	11
<b>Modeling of Fiber Bragg Grating Hydrogen Sensor with Multiple Membranes</b> Y.T. Luo, H. Wu, Y. Huang, X. Li, H.T. Song and Z. Wu	15
<b>Cluster-Head Election Algorithm for Wireless Sensor Networks Based on LEACH Protocol</b> Y.M. Miao	19
<b>Tapered Fiber-Optic Based Surface Plasmon Resonance Sensor</b> X.M. Wang, C.L. Zhao, R.G. Yang, Y.R. Wang, F.F. Shi and S.Z. Jin	23
<b>Optical Temperature Sensing of Core-Shell Structured <math>\text{NaYF}_4\text{:Yb}^{3+}</math>, <math>\text{Er}^{3+}</math>@<math>\text{NaYF}_4</math> Nanocrystals with Different Shell Thickness</b> D.D. Li, Q.Y. Shao, Y. Dong and J.Q. Jiang	27
<b>Two-Photon Sensing of Dopamine by Using Au Nanoparticles</b> C.F. Jiang, N.Y. Gao, Q.S. Wu, Y. Sun and Q.H. Xu	31
<b>Present Situation and Prospect of Internal Sensors for UHF Detection in GIS</b> Y.B. Duan, H. Zhang, J. Yong, B. Yang, X.L. Hu, X.B. Sun, H.L. Meng, X.Y. Feng and Y.P. Xu	38
<b>A Low-Cost MEMS Implementation Based on Sensor Fusion Algorithms</b> X.W. Wang and J.H. Jiang	42
<b>A Novel Gas Sensor for Chemicals On-Line Detection in Transportation</b> D.J. Zhao, J. Liu, F. Yan and Y. Xu	46
<b>A Perimeter Intrusion Detection System Based on Sensor Network for Airport Application</b> C.X. Liu and K. Lu	50
<b>A QCM Immunosensor for Rapid Determination of Ractopamine in Food Based on Enzyme-AuNPs for Signal Amplification and Magnetic <math>\beta</math>-Cyclodextrins for Extraction</b> S.X. Chen, J. Liu, D.D. Pan and N. Gan	56
<b>Acoustic Pressure Sensing with Hollow-Core Photonic Bandgap Fibers</b> A. Abdallah, C.Z. Zhang and Z. Zhong	61
<b>An Energy-Balanced Path Plan Strategy for Mobile Sensor Networks</b> L.L. Zheng, Q.L. Tang and X. Li	65
<b>An Improvement Strategy for DV-Hop Localization Scheme in Wireless Sensor Networks</b> Q.Q. Shi, J.J. Zhou and J.P. Zhang	70
<b>Application of Wireless Sensor Network in Embedded Smart Home System</b> P.J. Zhang, G.Z. Guo and Z.Z. Yu	74
<b>Architecting Publish/Subscribe-Based Middleware for Wireless Sensor Networks</b> B. Dong	79
<b>Configurable Node of Sensor Network for Smart Grid</b> Z.W. Hu, R.Y. Xie and Z.Y. Xie	83
<b>Design a Wireless Sensor Node for Rotating Machinery Condition Monitoring</b> Y. Zhang, K. Zheng, B. Chen, Y.F. Dong, M. Wang and T.L. Li	89
<b>Development of a New Signal Processing System for Pin-Cushion Position Sensitive Detector</b> W. Chen, S.H. Chen and D. Luo	93
<b>Finite Element Analysis on Multi Parameter Characteristics of Inductive Lubricating Oil Wear Debris Sensor</b> Y.B. He, W.W. Feng and K. Jiang	97

<b>Millimeter Wave Characterization of Wire Bond Transitions for W-Band Electromagnetic Sensor</b>	
Y. Fang, B.Q. Zeng, W.T. Zhang and P. Wang	103
<b>Optimizing Power Consumption for the Wireless Sensor Node</b>	
H. Lin	107
<b>Rapid Quantitative Detection of <i>E.coli</i> O157:H7 by a Impedance Immunosensor Based on Four-Wire Interdigitated Microelectrodes</b>	
H.Y. Wu, X.Y. Guo, Y.P. Yu, Y.M. Zuo, Y. Wei, Y. Liu and J.X. Ma	111
<b>Reach and Application of Electronic Nose on Testing the Quality of Agriculture Products</b>	
J. Chen, Y. Sun and L. Shen	116
<b>Research on Digital Substation IOT Based on SAW Sensing Technology</b>	
D.W. Lv, X.J. Li, L.X. Yang, D.J. Liu, K. Xiong, X.B. Liang, S.F. Li and B. Zhang	125
<b>Research on Pronunciation Assessment Detection Method Based on 3D Modeling and Sensor Technology</b>	
L.J. Shi, X.X. Yu, J. Zhao and Q.S. Du	129
<b>Survey on Mobile Target Localization in Wireless Sensor Networks</b>	
P. Jiang, X.L. Pang and L. Dong	133
<b>The Electric Vehicle Drive System Considering Current Sensor Fault</b>	
H. Ye, X.J. Fu, Z.Y. Zhang, C.L. Que and H. Xiao	140
<b>Flexible and Transparant Pressure Sensor Based on Pyramidal Elastomer with High Conducting Graphene Thin Film</b>	
X.X. Zhang, S.T. Hu, K. Qasim and B. Long	144

## **Chapter 2: Smart and Functional Materials and Technologies, Analysis, Design, Processing**

<b>Analysis for Smart Beam with Secondary Converse Piezoelectric Effect</b>	
Y. Zhou, S. Li and L.B. Xie	151
<b>Application of Structural Characteristics and Electromagnetic Shielding Effectiveness of Graphene</b>	
X.L. Song, A.H. Chen, L. Wei and D.T. Yue	155
<b>Effect and Optimization Study of Composite Insulator Sheds Radius on Electric Filed Distribution</b>	
H.X. Miao, B.S. Qi and C.C. Cai	159
<b>Formation of WS<sub>2</sub>/MoS<sub>2</sub> Particles with Nanoscale Layers for Multipurpose Application</b>	
Y. Irtegov, V. An and M. Azhikhin	164
<b>Study of the Behavior of 3d-Shell Electrons in ZnO Based Varistors Doped with Semiconductor Additives</b>	
T.Z. Yang, Q.T. Zhu, J.J. Wei, Z.Q. Zhang, R.R. Zhang, S.S. Meng and S. Zhou	168
<b>Study on Manufacture Process, Micro-Hardness and Hall-Petch Relation of Pure Rutile Phase TiO<sub>2</sub> MAO Coating</b>	
Y. Li and K.F. Song	175
<b>Vibration Control by Using Piezostack Based Mount</b>	
C.X. Cui	180
<b>Design and Implementation of LCD Based on FPGA</b>	
Q.F. Zhou and J. Yang	184

## **Chapter 3: Remote Sensing and Telemetry Technology**

<b>Applying Data Mining Techniques on Continuous Sensed Data for Daily Living Activity Recognition</b>	
Y.J. Li and H. Song	191
<b>Hyperspectral Estimation Models for the Saline Soil Salinity in the Yellow River Delta</b>	
H.Y. Chen, G.X. Zhao, Y.Q. Liu, J.C. Chen and H. Zhang	197
<b>GIS-Based Urban Land Use and Traffic Coordination Evaluation System</b>	
Y.J. Sun, W.X. Qiao, Y.S. Zhang and Y. Yang	204

<b>Inversion of Aerosol Optical Depth Based on MODIS Remote Sensor</b> C.F. Li, Y.Y. Dai, F. Liu and J.J. Zhao	209
<b>Research and Implementation of Three-Dimensional Power Lines Selection System Based on Aerial Images</b> P. Zhao, H. Li, Y.N. Li, W.W. Lu and J.X. Wu	213
<b>Study on Remote Sensing Images of De-Blurring Based on Dictionary Learning</b> Y. Jia, Z.T. Qin and B.X. Yang	217

## **Chapter 4: Intelligent Information and Expert Systems, Applications for Management and Product Design**

<b>Design and Research of Relay Protection Fiber Channel Intelligent Management System</b> G.X. Shao, J. Lu and H. Yu	225
<b>Parking Information Monitoring and Management System Based on Internet of Things Technology</b> G.L. Wu and D.S. Yan	229
<b>Smart Home Control System Based on Internet of Things</b> J. Zhu, X. Jia and X.Q. Mei	233
<b>Design and Realize the Measurement and Administration for Steel and Iron Enterprise</b> Y.Z. Liu and Y.X. Liu	238
<b>Design of a Smart System for Treatment of Hemorrhagic Shock in Prehospital Settings</b> H.Z. Lu, C.F. Wang, D. Wang, H.T. Wang, X.Y. Tian and T.H. Wu	242
<b>Design of Embedded Smart Home System Based on Internet of Things</b> P.J. Zhang, G.Z. Guo and Z.Z. Yu	247
<b>Improving the Multi-Agent General Cooperation Model Based on SVD</b> Y. Chen and Y. Jing	251
<b>Intelligent Online Monitoring and Anti-Theft System for Underground Cables</b> X.F. Tong, J.N. Zhang, W.T. Li and D.X. Zhang	256
<b>Model-Based Synthetical Optimization Analysis on Navigation Performance of Unmanned Surface Vehicle</b> T.Y. Ma, S.L. Yang, C. Hang, Q. Yu and Y.Y. Wen	260
<b>Modified Couple Map Car-Following Model Based on Two Preceding Vehicles Information</b> X.Y. Li, T. Zhou, Y.J. Ren and Y.X. Li	267
<b>Operational Risk Identification and Evaluation System of Power Grid Enterprises Based on Principal Component Analysis</b> Y.X. Sun, H.X. Wei and Q.Y. Yan	271
<b>Personalized Product Design Knowledge Acquisition Based on Knowledge Reduction and Knowledge Mining</b> E.T. Hua, D.Q. Chen, X.J. Gong, L. Hu, Y.Z. He and D.Z. Sun	275
<b>Research on Decision Framework for Multi-Hazard Resilient and Sustainable Buildings</b> Y.F. Xue, H.L. Sun and Y. Duan	281
<b>Study on Integrated Spatial Database for Composite Urban Disaster Risk Assessment</b> L.Y. Kong, Y.C. Tao, J. Liu and A.H. Wu	285
<b>The Application of IOT in Communication Room Monitoring and Asset Management</b> S. Yang, Y. Liu, C.Z. Cheng and D.W. Sun	289
<b>Embedded Durability Monitoring System – A Key Part of Ensuring the Service Life of the Hong Kong-Zhuhai-Macao Bridge</b> X. Fang, Y.B. Tang, L. Chen and H.H. Li	294
<b>Study of Cloud Computing Security and Application in Safe City</b> Y. Li and J. Li	299
<b>Design and Implement of a Flexible Workflow Model Based on UML Modeling Technology</b> F.Y. Yang, Y. Chen, Z. Hu, W. Zheng and X.L. Duan	304
<b>Performance Evaluation for an Automatic Target Recognition System with the Application of Sugeno Fuzzy Integration</b> Y.P. Li, Y.L. Qin and H.Q. Wang	311

## Chapter 5: Algorithms, Computation Methods and their Applications

<b>Design and Implementation of Space Target Detection Algorithm</b> L.P. Chen, F.Q. Zhou and T. Ye	319
<b>A Quantum-Inspired Evolutionary Algorithm with Elite Group Guided</b> S. Xiang and Y.G. He	323
<b>A Track-Based Gesture Recognition Algorithm for Kinect</b> Y. Wang and L. Zhang	334
<b>A Novel Error Modified Method for RSSI Location Algorithm Based on Neural Network</b> X. Liang, X. Feng and L. Yao	339
<b>Curve Model of Adaptive Interaction Model Algorithm Tracking Method</b> X.L. He and J.S. Yang	344
<b>Design and Implementation of Floyd-Steinberg Algorithm Based on FPGA</b> J. Yang, Z.J. Li and W.L. Li	350
<b>A Residual Variance Based Discriminant Function and its Algorithm</b> J.J. Zhang, Y.X. Song and Y. Qu	354
<b>An Improved Genetic Algorithm for Multi-Depot Heterogeneous Vehicle Routing Problem with Simultaneous Pickup and Delivery Time Windows</b> Y.G. Cai, Y.L. Tang and Q.J. Yang	361
<b>Circuit Fault Diagnosis Based on OEMD and SVDD Classifier of KFPCM Optimal Algorithm</b> J.F. Shan and L.W. Wang	366
<b>Design Algorithm of Moving Target Adaptive Tracking System</b> J.B. Qu	373
<b>Design of Fuzzy Classification System Applying Expertise Based on Genetic Algorithms</b> Q.F. Zhou and J. Yang	377
<b>Fault Identification Algorithm of Power Grid Based on Wide Area Information and PNN</b> H. Wu, Q.Z. Li and W. Liu	382
<b>Lattice Reduction Algorithm Based Uplink MC-CDMA</b> U. Yunus, A. Hamdulla, Z.H. Jia and K. Ubul	391
<b>Partial Discharge Pattern Recognition Method for GIS Based on GA-BPNN</b> X.Y. Feng, X.L. Hu, J. Yong, B. Yang, X.B. Sun, Y.B. Duan, H.L. Meng and Y.P. Xu	397
<b>Research of Centroid Localization Algorithm Based on Grid Distribution</b> D.Y. Zou, C. Li and T.F. Han	401
<b>The Application of Spectrum Inversion Based on Genetic Algorithm to Recognition of Thin Layer</b> K.Y. Wang, D. Liu and S.L. Wang	405
<b>The Design and Implementation of 2D-DCT Algorithm Based on FPGA</b> J. Yang, Q. Han and H.Y. Li	409
<b>The Low Concentration Gas Detection Based on Genetic Algorithm Stochastic Resonance</b> J.J. Tong and Y.Q. Kang	413
<b>Wind Power Forecast Based on Artificial Bee Colony Algorithm</b> X. Zhang and G.C. Chen	417
<b>A Fast and Efficient Recursive Parameter Estimation Algorithm in Time Series Analysis</b> J.J. Zhang	423
<b>The Truncation Error and Correction Algorithm of the Support-Operator</b> J.H. Sun, Y.P. Zhang, S.C. Pang and M.J. Ma	430
<b>Changes in the Beam Parameters of Partially Coherent Sinh-Gaussian Beams after Passage through an Astigmatic Lens</b> C.W. Li, X.P. Kang and Z. He	434
<b>The Far Properties of Nonparaxial Cosine-Squared Gaussian Beams</b> X.P. Kang, C.W. Li, Z. He and L.M. Zhao	440
<b>Automation of the Formation of Organizational Technological Documentation</b> E. Korol, P. Kagan and T. Barabanova	444

## **Chapter 6: Mathematical Methods and Modelling, Information Technologies in Industrial Engineering**

<b>A New Method about Smart Identification of Electronic Information on Tropical Agricultural Products</b>	
L.L. Wang, H.X. Luo, J.H. Cao and S. Chen	451
<b>Design and Implementation of AIS Information Sharing Service Based on SOA</b>	
T. Chai, D.Q. Xiong, X.B. He and X.G. Zhang	455
<b>Empirical Analysis of Technical Efficiency in Information Services</b>	
B.Y. Li and Y.T. Zhou	460
<b>Existence and Uniqueness of Weak Solutions to a Thin Film Type Equation</b>	
B. Liang, H.Y. Shen, X.T. Peng and M.S. Wang	465
<b>Research on the Recursive Method of Real Time Variance Calculation for Non-Zero Mean Value Data</b>	
J. Liu and X.G. Pan	469
<b>The Forecast Method of the Free Bus Sharing Rate</b>	
X.Y. Fan, J. Qian, X.H. Chen and H.J. Liu	475
<b>Trip-Generation Forecasting Model Based on Entropy of Land-Use Mixing</b>	
Y. Wang and K.M. Chen	479
<b>New Asymmetric Five-Parameter Logistic Model for Forecasting Petroleum Consumption in China</b>	
L.Q. Ji and D.D. Fang	483
<b>A New Car-Following Model with the Consideration of the Leader's Acceleration</b>	
T. Zhou, Y.X. Li and Z.W. Bai	489
<b>An Approach for Active Odor Source Localization Based on Particle Swarm Optimization</b>	
M.C. Men and L.W. Chen	493
<b>Research on Safety Levels in the Chinese Construction Materials Industry Based on Gray Model Forecasting</b>	
S.X. Liu, W.D. He, Z.H. Liang and X.B. Cheng	499
<b>Soliton Wave of Car-Following Model with Anticipation Effect</b>	
J.Q. Wu and S.K. Li	504
<b>Research on the Simulation of Random Road Excitation in Time-Domain</b>	
Y.F. Zhu and L. Wang	508
<b>The Application of Fuzzy AHP in Safety Evaluation of Highway Construction Crossover Operation</b>	
Z. Lu, H.K. Yu, P. Gang and X.Y. Ni	512
<b>Research on Anchorage Location Selection in the Yangtze River Based on Multi-Objective Optimization</b>	
X.D. Liu, L. Ming, L.W. Huang and H.L. Sun	519
<b>Digital Method for Acquiring Discontinuity 2D Density Based on 3D Digital Traces Model</b>	
J. Zheng, Y.S. Zhang, X.Z. Li and X.X. Shi	526

## **Chapter 7: Data, Text, Sound, Image, Signal and Video Processing and Technologies, Data Acquisition, their Applications**

<b>A Grayscale Image Vulnerability Authentication System Based on Compressed Sensing</b>	
X. Zhan, Y.R. Lei, H.M. Zeng and J.L. Chen	533
<b>A Novel Fast Pedestrian Detection Method</b>	
F.Q. Zhou and Y. Li	538
<b>An Image Classification Algorithm Based on SVM</b>	
C.H. Qian, H.Q. Qiang and S.R. Gong	542
<b>A Character Recognizer Based on BP Network</b>	
G. Yang, S.L. Xie and J. Huang	546
<b>A Study of a Normalized Error Calibration Method Based on Parallel High-Speed Data Acquisition System</b>	
W.X. Zeng, Y. Zhao and Z.Q. He	551

<b>The Micro-Video Label Classification System Design Based on Network Data Acquisition</b> B. Zhang, J.L. Song, Z.Z. Liu and H. Ji	556
<b>Boundary Stitching Method for Block-Based Parallel Error Diffusion</b> W.H. Zhu	560
<b>Research on the Method of Screening the Real Vehicle Data Fragment for Driving Cycle</b> S.P. Zhang and W. Zhang	564
<b>Application of Statistical Methods in Experimental Modal Frequency Extraction</b> J.W. Jiang, D.J. Zhou, B. Li, Y. Tang and X.Y. Xie	569
<b>A Novel Image Inpainting Method Based on Sparse Decomposition</b> X. Zhu, X.F. Zhang, Q.J. Li, J.Y. Tao and B.Y. Li	573
<b>A PVC Identification Method of ECG Signal Based on Improved BPNN</b> X. Yang, X.Y. Jin and J.F. Shen	578
<b>A Visual Dependency Analysis Method Based on VHDL</b> Z.X. Yi, X.M. Zhang, N. Li and X.D. Mu	582
<b>Adaptive Face Gender Recognition Based on NSGA-II and Compressive Sensing</b> L. Zhang	586
<b>An Algorithm for Electronic Image Stabilization</b> X. Jiang, P. Sun and H. Wang	590
<b>An Improved Image Segmentation Algorithm in Automatic Light Communication System</b> M. Liu, H. Zhang and D.J. Hu	594
<b>An Improved Method for CT Image Coding Using PSNR Prediction Model Based on ELM</b> H.Y. Zhu, X.Y. Jin and J.F. Shen	598
<b>Approach to Restoration of Blurring Image Based on Total Variation with Content Aware and Texture Enhancement</b> D. Yang and S.Y. Qin	602
<b>Camera Gesture Estimation for Confirming View Point of Virtual 3D Face Model</b> N.Z. Zhang and J. Wen	609
<b>DEM Generation and Accuracy Assessment Using ZY-3 Stereo Image Pairs</b> G.Y. Cai, J. Huan, Y. Liu and M.Y. Du	613
<b>Fast Approach to Video Stabilization Based on Hierarchical Estimation of Global Motion with Parallel Computation</b> Y.M. Lu and S.Y. Qin	618
<b>Gait Recognition Based on Locality Preserving Projections</b> C. Li, J.Y. Peng, J. Guo, X.F. Wang and X.Q. Wang	625
<b>Hand Posture Recognition Based on PCA</b> J. Wen and N.Z. Zhang	631
<b>Information System Design and its Application of Badminton Video</b> J.X. Yu	635
<b>License Plate Recognition System Design</b> R.F. Wang, X.J. Fu and W. Xu	639
<b>Matrix Based Feature Measurement and Extraction for Face Recognition</b> Q. Zhu, J.R. Cui and Z.Z. Fan	643
<b>Preparation of the Face Images in a Video Stream for Recognition and Filtering of Non-Informative Images</b> S.G. Nebaba, S.Y. Andreev and M.A. Makarov	648
<b>Registration of 3D Point Cloud of Human Body Based on the Range Images and RGB Images</b> Y. Wan, J. Lu and A.Q. Li	656
<b>Research on Evaluation System for Steganalysis Based on Image</b> X.Y. Ma and H.Y. Cheng	662
<b>Research on Facial Expression Computing in Experiment Process</b> Y.F. Xue, H.L. Sun and Y. Duan	666
<b>Research on Fault Diagnosis Algorithm Based on Multi-Source Data Analysis</b> L. Niu, Y.J. Li, J.X. Huang, J. Zhan, M.C. Ma, J.T. Cui and G.T. Lu	670
<b>Research on the Zero-Bit Watermarking Algorithms Based on the Matrix Decomposition for Digital Images</b> L.J. Fan	674

<b>Study on Image Enhancement Technique of License Plate Recognition</b> Y.B. Dong, G.L. Cheng and M.J. Li	678
<b>The Online Pattern Recognition Method of SF<sub>6</sub> Gas Leakage Based on Image Recognition</b> J.X. Huang, Y.J. Li, Y. Jiang, J. Zhan, L. Niu, J.T. Cui, M.C. Ma, D.S. He and G.T. Lu	682
<b>The Test and Time-Frequency Domain Analysis on Plant Electrical Signal Based on Virtual Instrument</b> L.L. Wang, H.X. Luo, J.H. Cao, K. Lu, J.H. Fang and S. Chen	686
<b>Video Stabilization Algorithm Based on Background Feature Points Matching</b> S.J. Ji, M. Zhu and Y.M. Lei	690
<b>The Assembly Error Detection of Automotive Airbag Based on Machine Vision</b> X.D. Wang, Q. Liu and W. Zhang	694
<b>Quantization Methods of the Reliability-Based Iterative Decoding Algorithm for LDPC Codes</b> H.Q. Chen, L.S. Luo, X.L. Huang, D.F. Li, Q. Liang and T.F. Qin	699

## **Chapter 8: Testing, Detection, Measurement, Monitoring Technologies and Instruments**

<b>The Design of Wireless Monitoring System Based on the High-Speed Rotating Fan of the STM32</b> Y. Sun, Y.W. Dai, W.Z. Wang and P. Li	707
<b>Multi-Target Detecting and Extracting Rule Based on Frequency and Range Information</b> J.Q. Li, C.Q. Feng and D. Zhang	711
<b>Void Fraction Detection in a Gas-Liquid Two-Phase Flow Using a Propagation Attenuation Method</b> C.G. Zheng, Y. Chen and Y.Y. Huang	715
<b>Design and Implementation of a Remote Monitor System on Potted Flowers</b> W.L. Zhang, Z.B. Guo, Q. Zhou and K.X. Wang	720
<b>Design of On-Line Monitoring System of Partial Discharge in GIS Based on the Combination of Acoustic and Electric</b> X.L. Hu, J. Yong, B. Yang, M.L. Liu, H.L. Meng, X.B. Sun, Y.B. Duan, X.Y. Feng and Y.P. Xu	726
<b>Advances in Intelligent Visual Surveillance Technology</b> Y. Ding, Y.H. Li and B. Li	730
<b>Algorithm Research of Current Injection in Output Control of Accelerometer Based on INS Onboard Hardware in Loop Real-Time Test System</b> Z.Y. Zhang, Y. Zhao and Y.S. Liu	734
<b>Applying Lightweight UAV in Landslide Monitoring</b> L. Peng, F.F. Tang, Z.Y. Zhou, X. Liu and Z.M. Ruan	738
<b>CCD Temperature Measurement System Design Based on Truncated Mean Weighed Algorithm</b> F. Xue and F.T. Dong	746
<b>Intelligent Inspection of the High-Speed Train Bogie Flaw Based on Eddy Current</b> J.H. Zhou, Z.Y. Liu and G. Chen	751
<b>Intravenous Find Equipment Based on DSP</b> J.Q. Chen, D.F. Huang and H. Liu	755
<b>Investigation of Broadband Wavelength Conversion Based on Cascaded Second-Harmonic Generation and Difference Frequency Generation</b> J.S. Guo, Z.X. Wang, H.D. Wu and Y.W. Wu	759
<b>Real-Time Tracking and Locating of Radioactive Source in Transport</b> X.W. Wang and H.W. Qin	763
<b>Research on a Sleep Security and Energy-Saving Device</b> R.H. Li, J.B. Fu, Q.L. Fan and Z.Y. Hou	767
<b>Study on Wheel Run-Out Detection System Based on Harmonic-Analysis Principle</b> Y.Z. Men, X.D. Yang, J.G. Gao, L. Yu and H.B. Yu	771
<b>Test Study on Resistance-Reducing Measures of Trimaran Planing Hull</b> Q.X. Wang	775

<b>The Design and Implementation of Moving Object Detecting Algorithm in Intelligent Video Surveillance</b> J.H. Sun and C.H. Tian	779
<b>The Design of Air Quality Detecting Intelligent System</b> S.S. Zhang, L. Long and Y.P. Huang	784
<b>The Development of a Intelligent Performances Testing System for Lithium Battery Casting</b> X.M. Liu, W. Chen and H.N. Tu	788
<b>The ECG Monitoring Terminal Design of Family Used in Telemedicine</b> J.X. Yao, D.F. Huang and J.Q. Chen	797
<b>The Knowledge Representation and Reasoning for Agents Based on the Elderly Monitoring</b> H.J. Gu, S.S. Lu and Y.A. Huang	801
<b>The New-Generation Smart Substation Protective Equipment Testing Technology Research</b> W. Li and L. Su	805
<b>The Research on Monitoring System of Open-Pit Slope Based on Beidou</b> L.J. Zhou, C.W. Lu and Q.H. Gu	812
<b>The Tape Measurement System Based on Computer Vision Technology</b> H.Z. Li, J. Lu, J. Wang and T. Jia	816
<b>Distributed Capacitance Calculation Model in GIS Voltage Transformer's Error Test</b> X.S. Chen, Y.S. Li, Y. Jiao and G.C. Lei	820
<b>Study on Detection Method of Moment of Inertia with Torsion Pendulum Method in Frequency Domain Based on FFT</b> X.L. Zhang, L.S. Zhang, B. Zou, W.Y. Tang and Q.F. Shao	826
<b>Practical Method for ECG Classification Using Weighted ELM</b> H. Liu, X.Y. Jin and L.J. Li	832
<b>Ultrasonic Detection Apparatus for Scanning 3D Objects</b> E.A. Rybakov, D.P. Starikov and D.Y. Berchuk	836
<b>Design of Digital Asthma Diagnosis System</b> D.D. Wang and M. Cao	840
<b>Process Monitoring of Filter Press in Hydrometallurgy Based on PCA</b> Q.K. Wang, X.Y. Zou, S. Wang, D.K. He, Y. Zhou and J.Z. Wang	844
<b>Research on the Master Meter Method and Static Weight Method Flow Standard Device</b> X. Qin	849
<b>Research on Energy Consumption Test and Data Process Method of Gravure Printing Machine</b> J.J. Bai, Y.M. Wang and Y.C. Yuan	854
<b>Fault Diagnosis of AUV's Thrusters Based on SVM</b> L. Wan, Y.H. Zhang, Y.S. Sun and Y.M. Li	858
<b>Research on the Collision Detection Technology of Coal-Cutting Machinery in Remote Virtual Control</b> A.L. Qi, H. Wang, H.Y. Wu and H.W. Ma	863
<b>The Design of the Diameter Measuring Gauge of Filter Rod Forming Machine Based on TRIZ and TOC</b> Z.H. Yang, B.G. He and C.L. Yang	867
<b>How to Support the Diversity of Network Measurement Requirements</b> J. Wang, B.Q. Wang, K. Zhu and J. Shen	872
<b>The First Arrival Cycle Judgment Based Calculated Method for <i>In Situ</i> Acoustic Measurement of Attenuation in Water</b> D.P. Zou and R.H. Liu	877
<b>Evaluations of Measurement Methods for Parallel Strand Cables</b> Z.J. Zhang, J.Q. He, Y.C. Lin, X.H. Liu and X.C. Han	882
<b>Full-Field Displacement and Strain Measurement: Application of Digital Image Correlation to Reinforcement Corrosion Induced Concrete Fracture and Cover Cracking</b> Q. Li, H. Yu and J. Tong	889
<b>Measurement of Helmholtz Coil</b> J.F. Zhu, X. Yan, L.L. Zhou and X.X. Zhao	893
<b>Reactor Thermal Neutron Spectrum Measurement with Time of Flight Method</b> S.H. Liu, X.B. Jiang, W.S. Zhang, Q.Y. Yu, Y.H. Zhong, J. Yang, G.N. Zhu, K. Wang and D. Chen	899



<b>Study on Spatial Frequency Domain Algorithm and White Light Interference System Based on NMM</b>	
L. Jian, L.H. Lei, D.S. Li, Y.X. Fu, Y. Li, J.C. Hu and L.J. Deng	904
<b>The Study of Harmonic Energy Measurement Based on Atomic Decomposition Algorithm</b>	
Z.W. Qu, Y. Li and W.R. Hao	911
<b>The Research of Ship Profiles CNC Cold Bending Forming Curve Arc Angle Measurement Control Method Based on Cubic Parameter Spline</b>	
X.W. Li, B.H. Wu and L. Ling	915
<b>The Algorithms of AE Processing for Automated Systems to Measure Rheological</b>	
H.W. Qin, F.C. Cao, V.N. Ovcharuk and M.J. Aishan	921
<b>Design and Implementation of Security Dynamic Monitoring and Management System for School Children</b>	
Y. Liu, G.Y. Cai, C. Zhang and M.Y. Du	926

## **Chapter 9: Mechatronics, Industrial Robotics, Automation and Control Technology**

<b>Control System for the Mountainous Orchard Electric-Drive Monorail Transporter</b>	
Z. Li, P. Xu, Y.P. Ouyang, S.L. Lv and Q.F. Dai	935
<b>Force Analyzing and Parameter Optimization of the Telescopic In-Pipe Robot</b>	
D. Qu, H. Song and J. Sun	941
<b>Design and Implementation of A-SMGCS Terminal</b>	
J. Li, L.M. Wu and P. Zhu	946
<b>Design and Implementation of Self-Balancing Electric Vehicle Control System</b>	
B.S. Qi, K. Wang, X.X. Xiao and H.X. Miao	950
<b>A Hierarchical Control Strategy of Multi-Microgrids</b>	
L. Fan, L. Wei and X.J. Zhao	955
<b>A Research on Control System of Solar Energy Collecting and Tracking</b>	
S.P. Gao, X.M. Liu and H.N. Tu	962
<b>Coke Oven Temperature Implicit Generalized Predictive Control</b>	
L. Zhang, C.J. Zhang, Q.Y. Xu and Z.J. Bao	968
<b>Design of a Multi-Function Half-Real Object Integration Research Platform Based on Virtual Instrument</b>	
Q.F. Niu, S.S. Chen, L. Wang and Y.B. Hui	972
<b>Dynamic Performance Evaluation of Excitation Control System Based on Intuitionistic Fuzzy Sets Strategy</b>	
W.C. Zhang, X.P. Gu, H.P. Liang, Y. Lu and Y. Han	977
<b>Dynamic Simulation of an Organic Rankine Cycle (ORC) System Driven by Exhaust</b>	
Z.G. Wang, J.G. Cheng, Y. Wang and Q. Shen	986
<b>Force Control Based on Model Predictive for Lower Limb Rehabilitation Training</b>	
F.C. Cao and H.W. Qin	991
<b>Generic Component Based Aggregation Modelling for Reconfigurable Control</b>	
H.X. Hu	995
<b>Implementation of Hand-Free Head Mouse Control System</b>	
N.Z. Zhang, J. Wen and W. Li	999
<b>Incubation Chamber Temperature Controller Design and Simulation</b>	
Z.J. Lu and Y.J. Zhang	1003
<b>Optimizing Control Methods of Airport Pipeline Refueling Process</b>	
X.Z. Zhang, F.Q. Meng and J.H. Wang	1007
<b>Research on Autonomous Obstacle Avoidance of Mobile Robot Based on Hybrid System</b>	
Y. Liu	1012
<b>Research on Control System of Hot Molding for Bra Cups</b>	
R.P. Yu and J.F. Ni	1018
<b>Research on Fuzzy-PID Temperature Control System for Double Helix Resistor</b>	
Y.J. Wang, X.Y. Dong and Z.W. Qu	1022
<b>Research on Island Microgrid Master-Slave Mode</b>	
X.Q. Li and X.Y. Zhao	1026

<b>Research on the Experimental Platform with Real-Time Control Based on the Experimental Process</b>	
Z.L. Cui and J.E. Wang	1030
<b>Software Complex of Detection and Diagnosis of Hardware Failures in Robotic Marine Mobile Vehicles</b>	
S. Kopylov and A. Mazalov	1034
<b>Study of a Lithium Battery Automatic Shell Control System Algorithm</b>	
X.M. Liu and G.P. Liu	1039
<b>Study of Intellective Water-Level Controller</b>	
H.C. Wang, Y.R. Zhou and L. Wang	1048
<b>System Design and Implementation of Distribution Automation Evaluation and Analysis System</b>	
P. Li, F.Y. Che, Y.M. Qian and H.B. Zhang	1053
<b>Temperature Control System Based on Fuzzy Control Design</b>	
Y.J. Zhu	1061
<b>The Crawler Type Robot Climbing Stairs Device</b>	
X.J. Fu, C. Wang, J.Q. Liu, Z.Y. Sun and W. You	1066
<b>The Nonlinear Oscillation Simulation of Robofish's Two Joints Tail</b>	
X.H. Kong, X.L. Ji, K.X. Lu, C.R. Han, W.G. Qian and X. Pan	1070
<b>A Novel PID Controller Parameter Optimization Method</b>	
J. Wei	1077
<b>EKF-Based Sensorless Vector Control System of Permanent Magnet Synchronous Motor</b>	
W. Zhao, W.J. Huang and L. Zhang	1082
<b>Study on the Control Strategy and Algorithm for Head-Box</b>	
W.J. Zhang	1086
<b>The Controller Design of Gas Boiler Combustion Based on ARM and <math>\mu</math>COSII</b>	
G. Zhao and J. Li	1090
<b>Control of Three-Phase Stepper Motor Based on DSP</b>	
B.Y. Shen, K.J. Chen and X.C. Guan	1094

## **Chapter 10: Computer Networks, Communication Technology and E-Commerce**

<b>D2D Mobile Relay in TD-LTE-Advanced System</b>	
W. Wu, J.G. Liu and X.Z. Guan	1101
<b>A Survey of Real-Time Industrial Wireless LAN Research</b>	
Y.Q. Qin, Y.J. Cheng and C.J. Zhou	1105
<b>A Simplified Time-Domain Channel Estimation Approach for OFDM System</b>	
S.B. Huang, Y.C. Wen, W. Ye and T.L. Fan	1111
<b>Research of Improvement of GPSR Protocol in Vehicular Ad Hoc Networks</b>	
L.C. Zhang, X.N. Zhu, Z.G. Wang and G.H. Han	1115
<b>A Mobile Coverage Strategy for Sparse Overlay Network</b>	
X.L. Zeng	1119
<b>A Rapid Anti-Collision Method for RFID Tag Identification</b>	
H.P. Zhang, J.J. Li, Z.L. Chen and B. Wang	1123
<b>Analysis of Dropped-Call Probability in Relay-Based High Speed Railway Environment</b>	
Y.Z. Li, X.Y. Jin and D.P. Wu	1129
<b>Application of Network Security Technology in the Internet Finance</b>	
X.L. Jing	1133
<b>Delay-Aware and Self-Adaptive Packet Scheduling for MPTCP</b>	
M. Hu, S.W. Wang and F. Yang	1137
<b>Design and Implementation of Staff Tracking and Positioning System Based on Combination of RFID and Zigbee</b>	
S.H. Cao, L.D. Wang, Q.H. Wang and H.X. Zhang	1141
<b>Design Considerations for Reliable Data Transmission and Network Separation</b>	
X.C. Xu	1146

<b>Heuristic Algorithm Based Traffic Classified Routing Algorithm in Distributed Satellite Cluster Network</b>	
N. Jiang, Y.Z. He and L. Guo	1150
<b>MP2P Resource Node Selection Strategy Based on Altruism and Bayesian Game</b>	
Y. Liu, G.Y. Zhang and J.Z. He	1160
<b>Network Security Study Based on Data Farming</b>	
X. Fei and J. Zhou	1169
<b>Performance Simulation of the SCTP under the Multi Path Environment</b>	
Y.Q. Fan, S.T. Liu and C. Li	1174
<b>Protocol Design for Free Space Optical (FSO) Communication</b>	
R.H. Guo, C.S. Liu, H.K. Wang, J. Wu and J.F. Chong	1178
<b>Realization of Communication and Management in the PhoneSat Based on AOA Protocol</b>	
S. Wu, X. Song, D. Chen and X.Q. Chen	1185
<b>Research and Practice on the Construction of Campus Network Security</b>	
X.L. Jing	1189
<b>Research on Hop-Based Secure Positioning Algorithm in WSN</b>	
J. Luo, S. Han and Y.L. Lu	1193
<b>Research on Multi-Core Network Equipment Virus Defense System</b>	
Y.W. Xu and F. Dong	1197
<b>Review of the Development of Mobile Electronic Commerce</b>	
Z.Y. Zeng and J.B. Song	1201
<b>Simulation and Analysis for Meteor Burst Communications Based on OPNET</b>	
Z.X. Yi, Y. Xian, X.M. Zhang, H.P. Zhang and X.D. Mu	1205
<b>Study of Application in Network Intrusion Prevention</b>	
J. Li and Y. Li	1209
<b>Study on the DDS Network Information Security Technology</b>	
Z.Y. He and Y. Liang	1213
<b>The Application of TD-LTE230M Wireless Power Broadband Network Technology in Smart Power-Stealing Prevention System</b>	
L.X. Yang, K.A. Hou, C. Gong and H.P. Ding	1217
<b>The Design and Implementation of the Teaching Platform of Communication Interface of a Comprehensive Communication System</b>	
J.X. Liu, Q.Z. Zhou, Q.L. Liu and S.P. Luo	1221
<b>The Integrated Test Platform Design of Wireless Communication Equipment Based on the Circuit Analysis and Fault Diagnosis</b>	
D.W. Wang, W. Zhang, C.F. Qiu, J.H. Tu and Q.Z. Zhou	1225
<b>Trust Model of P2P Network Based on Fuzzy Degree of Credit</b>	
Y.C. Shen, H. Zhang and X.L. Duan	1231
<b>Research the Information Channels in Systems with Combined Data Using CDMA Method</b>	
X.X. Yu, X. Zhang, H.W. Qin and M.J. Aishan	1236
<b>Interactive Media-Based Information System Design and its Application</b>	
Y. Xu	1240

## **Chapter 11: Modern Electronic, Circuit Technology, Electrical and Power Engineering**

<b>Research and Design of Harmonic Analysis Module on Intelligent Power Grid</b>	
S.H. Zhang, W. Yang and Z. Chen	1247
<b>Research for Transient-Voltage Stability Based on Doubly-Fed Wind Power Generation System</b>	
L. Liu, H.M. Li, S.Q. Sheng and H. Li	1251
<b>A Novel Method for Optimal Capacitor Installation Location in Distribution System</b>	
Q.Y. Luo, T. Luo, L.Q. Sun and B.Y. Liu	1256
<b>Design and Implementation of the Chip for Energy Consumption and Energy Conservation and Pollution Reduction</b>	
Y.H. Chen, L.N. Zhang and J. Li	1262

<b>Design and Implementation of the Infrared Remote-Controlled Digital Clock Based on FPGA</b>	1266
J. Yang, H.Y. Li and L. Liu	
<b>Magneto-Rheological Vibration Reduction Control and ARM Realization</b>	1270
L. Wang, P.F. Liu, Q.F. Niu and Y.B. Hui	
<b>The LED Dot Matrix Control Technology Based on 51 MCU and CPLD</b>	1275
Y.C. He, M. Deng, Q.S. Zhang and X. Jin	
<b>UHV AC Placement Selection Method Based on the Short Circuit Current Coordination</b>	1280
L.L. Yu and Y.F. Rao	
<b>Design of Universal Interface Used in Function Modules of Remote Medical Monitoring Equipment</b>	1285
D.F. Huang, J.Q. Chen and G.H. Peng	
<b>Study on the Steady-State Stability Margin of a Weak Section by Using the Online Data of WAMS</b>	1289
W.C. Zhang, X.Q. Fan, Y.L. He, Y. Pan and Y. Lu	

## Chapter 12: Software Applications and Development

<b>The Application of Cross-Media Retrieval Technology Based on Ontology</b>	1299
H. Zhang, G.W. Xu, W.R. Guo, M.H. Liao, C.X. Xu, Q. Zhao and H.L. Zhao	
<b>Design and Application about System of Plant Science Popularization Based on the QR Code</b>	1303
J.H. Han and M.J. Li	
<b>Design and Implementation of Online Examination System</b>	1309
H.Y. Tian	
<b>Development of Test Platform of WAMS Application System</b>	1313
J. Pu, J.W. Si, Y.C. Huang, X.P. Shi, B. Li, W.C. Zhang and C.K. Zhang	
<b>Information System Design for Teaching System Based on Web</b>	1319
L.H. Wang	
<b>Research and Design of Cloud Integrated Multiple Identity Authentication in Digital Classroom</b>	1323
J.K. Song and X.Z. Liu	
<b>The Software Methods for Digital Textile Pattern</b>	1328
J.X. Su	
<b>Software Quality Evaluation for Vehicle Based on Set Pair Theory</b>	1332
X.Y. Liu and J. Zhang	
<b>The Research of the Relationship between Value Stack and Context Map Based on OGNL in Struts2</b>	1338
C.L. Li	
<b>Design of BOOKKEEPING Subsystem of LHAASO Project</b>	1343
B.B. Li, J.X. Yu, B. Suo and H. He	
<b>Realizes 3D Simulation of Campus Construction Based on Virtual Reality</b>	1349
T. Ai, H. Kang and Y.O. Ren	