

Table of Contents

Preface and Conference Organization

Chapter 1: Sensors and their Applications

A Dual-Wavelength Temperature Sensor Based on Fiber Optic Delay N. Yang, Q. Qiu and J. Su	3
An Efficient and Verifiable Privacy-Preserving Data Aggregation Scheme for Wireless Sensor Networks L.J. Yang, C. Ding and M. Wu	7
An Ultrasonic Rayleigh Wave Transducer and its Application to Nondestructive Pressure Measurement Z.W. Ling, W.Y. Cai, C. Li and W.C. Guo	11
Characterization of a Smartphone's CMOS Image Sensor Response to Radiation C.Q. Xu, J. Jiang, Z.Y. Ouyang and C.H. Qiu	17
Error Analysis and Algorithm Validation of Geomagnetic Sensor Y. Wang, J.Y. Zhang and D.W. Zhang	21
Firefly-Inspired Synchronicity with a Weighted Factor for Wireless Sensor Networks H.L. Zhao, P. Song and C.B. Hao	27
Study on Liquid QCM Sensor Design and its Response Model H.X. Chen	32
Study on Temperature's Character of Eddy Current Sensor Y. Tao, Z.F. Zhang, Y.S. Zhai, Y.L. Su and H.Z. Liu	36
The Research of Maglev Gyroscope Data Characteristics Based on Two Positioning Z. Shi, J. Ma and Z.Q. Yang	40
Refractive-Index Sensor Based on Metal-Insulator-Metal Waveguides T.T. Tang and L. Luo	46
The Study on After-Treatment System and Algorithm of Piezoelectric Micromachined Modal Gyroscope Y. Li, X.S. Wu, W.P. Zhang and W.Y. Chen	50
A PCR Chip with Reusable Electrodes and its Temperature Analysis J.T. Cao, F. Cui, W. Chen, Z.X. Guo, W.Y. Chen, X.S. Wu, W. Liu and W.P. Zhang	54

Chapter 2: Measurement Methods, Technologies and Systems of Testing, Detection and Monitoring

Evaluation of Measurement Uncertainty for Ball Pressure Test Based on Reading Microscope T. Xin, J.G. Zhou, S.Q. Su, Z.C. Xu and Y. Liu	61
Measurement Uncertainty Sources Analysis and Verification of Time-Grating with Variable Coupling Coefficient H.T. Yang, B. Fan, J. Zhou, Y.T. Fei and D.L. Peng	65
Quality Evaluation Apparatus and Method for Laser Shock Processing the Weld Used in FDSO F. Wang	71
Research on Mass Determination of International Comparison CCM.M-K4 of 1 kg Mass Weights M.H. Hu, J. Wang, Y. Zhang, C.Q. Cai, R.L. Zhong, H. Yao and J.A. Ding	75
Study on Time of Flight Measurement for Ultrasonic Tomography S.Y. Ren, S. Liu and C. Song	80
The MCCB Electrical Clearance and Creepage Distance Measurement Uncertainty Evaluation J. Zhang, F. Wang, J.G. Zhou and M.L. Hu	86

Voltage Measurement with Improved Multi-Slope Integral Analog-to-Digital Converter X.S. Zhao, X.J. Wang, D. Niu and C. Li	90
Measurement and Analysis of Concrete Curling Slab Using Imbedded Sensors W. Qiang	95
Low Conductivity Material Detection Method Based on Eddy Current and GMR Sensors K. Jiang, H.M. Lei and H. Zhao	99
A Research on Improving the Precision of Rotating-Wave Plate Polarization Measurement M.H. Hou, W.M. Lin and Z.J. Fan	105
Application of Image-Pro Plus in the Groove Filter Rod Characteristic Parameters Measurement L. Zhao, W.L. Liu and W. Ying	111
Ultrasound Imaging Using Spatial Domain Phase Information L. Yang, C.G. Xu, X.L. Li and Y. Huang	118
New Method for High Wind Speed Retrieval Using Altimeters Observations Y.Z. Gu, P.L. Li and K.G. Fan	123
Review on Non-Destructive Testing Technique of Eddy Current Pulsed Thermography J.M. Zhou, J. Yang and Q. Wan	128
Satisfaction Track Extraction Model Based on Threshold Detection H.D. Bin and X.X. Zhi	132
Simulation of Depth Resolution for MFP Passive Detection X.Y. Luo, Q.B. Han, D.F. Zhou, J. Li, C. Yin, H.H. Fan and C.P. Zhu	136
The Analysis of the Testing Accuracy of the Anti-Force Rolling Brake Testing Platform X.W. Zhu, F.S. Zuo, Y. Xu and X.K. Shi	140
Introduce the Quantitative Identification Method of Rolling Bearing in the Application of Fault Detection L. Huo	147
Detecting Drivers' Stress in Emergency Using Physiological Sensors Y. Chen	150
The Research of Intelligent Mining Subsidence Prediction System J.Z. Tian and K. Zhu	158
The Electrical Properties of the Probe under Different Loading Frequencies Q. Yuan, L. Han and C.L. Liu	163
Super Resolution and Denoising Model Research on TOF Camera N. Xu and Y. Piao	168
Mixed Measurement Form System Base on State Estimation on SCADA/PMU Y.B. Xie, Y.J. Ge and T.T. Sun	172
Monitoring System of Status of Traction Plate and Pulley in Stringing Construction Y. He, S.G. Zheng and G. Liu	176
Research on Monitoring System of Gas Flow Meters Based on ZigBee Wireless Network J. Zhu, L.Q. Wang, G. Zhao, G.D. Liang, X.X. Mao and B. Yan	182
Design of Wireless Temperature Measurement System for Chicken Hatch Field Based on LabVIEW J. Mo, M.Z. Liu, J.B. Yang and X. Wang	186
Goaf Temperature Monitoring System Based on ZigBee Revised Routing Algorithm M.T. Huang and X.F. Lei	191
Design and Application of Distributed Solar Power Quality Detection System X.F. Chang, X.Y. Lv, Z.Y. Piao and D.X. Li	195
Modal Analysis of Gantry in Axle Multi-Parameter Measurement System J. Duan, Y.T. Liu and W.G. Cao	199
Design of Data Acquisition System Based on Ethernet and Virtual Instrument Technology L. Han and Y.S. Li	203
One Operational Visual Method for Oil Spill Detection by SAR Image P. Chen, K.G. Fan, Y.Z. Gu and K. Xu	208
A New Rapid Detection of the Temperature Coefficient System X.Y. Li, X.Y. Chen, F. Xiao, N. Liu and Q.H. Liu	212
Design of Dust Monitoring System Based on Embedded Linux Y. Feng and L. Zhou	216

The Power Cable Online Monitor and Protect in Application System W.Q. Lai, Z.H. Yang and C.Y. Liu	221
The Power Cable Online Monitor and Posit No-Blind Area G.Y. Jiang, H.Q. Zhang and H.B. Liu	226
Multiplexed Voltage Measurement for Serial Connected Power Li-Ion Battery String L.Y. Liu, H.X. Shen and W.Z. Zhu	229
Research of Infrared Electro Optical System's Operating Range on Hypersonic Vehicle J.W. Zhou, Z.G. Shi, J.C. Li, X.P. Lu and X.W. Lu	234
Soft Measurement of the Cell Concentration Based on SVM H. Meng, H. Gao and B.Y. Zhao	239

Chapter 3: Technologies and Methods of Processing Data, Images and Signals

A Segmentation Algorithm Research of Forest Fire Image Based on YCBCR and Improved Local Fractal Dimension A.P. Jiang, D.D. Bai and B.Y. Zhu	247
An Integrated Method for XRII Image Distortion Correction Y.J. Li, H.Z. Shu, T. Wang, Y. Wang and Y.Y. Kong	252
Facial Expression Recognition Based on Gabor Texture Features and Centre Binary Pattern L.S. Li, Z.L. Ying and B.B. Huang	257
Monitoring Data Filter and Deformation Information Extraction Based on Wavelet Filter and Empirical Mode Decomposition A.B. Zhang, T.Y. Chen, X.X. Liu, Y.J. Zhang and Y.T. Yang	261
New Segmentation Scheme for Low Quality Fingerprint Images B. Guo, B. Han and L. Niu	272
Research on Image Restoration Methods Y.B. Dong, H.X. Zhang and Y. Sun	277
Translation Compensation Based on Cycle Subtracting of Micro-Doppler Curve D. Zhang, C.Q. Feng, Y.S. Zhang and J.Q. Li	281
An Object Tracking Method Based on Illumination Compensation D.W. Yang, Y. Qi and L.P. Liu	286
Monocular Structure from Motion Based on Angular BA X.Z. Li, A.L. Yang, H. Qiu and S.M. Jia	290
A Genenal Feistal Structure Based Color Image Encryption Algorithm B. Lu, Y.C. Li and F.L. Liu	294
Face Recognition Algorithm Based on Haar-Like Features and Gentle Adaboost Feature Selection via Sparse Representation Q.W. Wang, Z.L. Ying and L.W. Huang	299
Real-Time Image Shift Detection with Cross Correlation Coefficient Algorithm for Correlating Shack-Hartmann Wavefront Sensors Based on FPGA and DSP T.T. Shen, L. Zhu, L. Kong, L.Q. Zhang and C.H. Rao	303
An Improved Method for Power Harmonic Analysis Based on Blackman Window and Phase Difference Correction W.J. Xia, Y.S. Jiang and J.J. Cai	312
Action Recognition of Sleeping at the Desk Using Regression on a Dependency Graph W. Luo, L. Yu, M. Feng, G.Y. Hong, Q.W. Peng and Z.H. Li	318

Chapter 4: Artificial Intelligence and Expert Systems, Algorithms and Applied Computational Methods

Analysis of Nuclear Power Plant Transient Recognition Method Validation Utility Strategy Y.W. Li, J.X. Liang and Q.Q. Ding	325
Application of an Improved Colored Petri Net Modeling Method in Certain Missile Training System C.J. Wang, W. Yue and H.Y. Ji	330

Bistatic Polar Format Algorithm Based on Wavenumber Vector C.D. Qi, S.W. Shi, K.N. Peng, H.Y. Huang, J.C. Xu and D.C. Kong	335
Data Mining Based Intelligent Retrieval Algorithm and its Application C.P. Wang	340
Identification of Thermal Process Based on Relevance Vector Machine and Firefly Algorithm X.Z. Qiu, G.D. Bai, B.H. Huang and W. Xu	344
Intelligent Vehicle Path Planning Based on Improved Artificial Potential Field Method Z. Pan, J.Q. Li, K.M. Hu and H. Zhu	349
Neural Network Expert System in the Application of the EMC Design J.L. Tang, N.F. Li and H.L. Liu	355
Optimization of Multi-Objective Coverage Strategy Based on Multiple Particle Swarm Coevolutionary Algorithm for Water Environment Monitoring System H.W. Zhao and L.W. Tian	360
Research on Function Module Clustering Based on the Rule-Immunity Algorithm for Complex Product X.Y. Chen, G.B. Wu, H. Zhao and Q.F. Sun	364
The Temperature and Pressure Information Fusion Based on BP Network G.Y. Li, Z.H. Wang, K. Yang, S.M. Jia and Y. Li	372
Yarn Quality Prediction and Process Parameters Optimization Based on Genetic Algorithm and Neural Network J.G. Yang, L. Xu, Z.J. Lu, Q. Xiang and B. Liu	377
An Optimization Model Based on Principal Component Theory and Genetic Algorithm X.F. Huang	384
Application of Fuzzy Mathematics Model in Evaluating Order Priority F. Ma, H. Gu, W.H. Xu and Q.Q. Tao	390
Data Mining Algorithm and its Application with Massive Text Database C.P. Wang	395
Exponential Stability for Stochastic Neural Networks with Time-Varying Delay and Leakage Delay Y.J. Li and J.Z. Li	399
Simulation of Traffic Flow in Hurricane Emergency Evacuation Use Dynamic Control Strategy C. Mao, S. Chen and P.F. Yang	404
A Time Series Analysis and Neural Network Based Scheme for Fault Diagnosis of Transformers J.J. Zhang, Y.X. Song and Y. Qu	412
The Proof of Strong Markov Property Based on one Definition R. Tang and Y.X. Dong	419
Strong Consistency of Maximum Likelihood Estimators in Compound-Sequential Logit Model C.M. Yin, F.F. Li and L.J. Su	429
Sparse L_p-Norm Based ICP for 3D Registration X.Z. Li, B.L. Qin, H. Qiu and S.M. Jia	433
A Practical Approach for Digital Forensic Triage J.G. Jiang, B. Yang, S. Lin, M.X. Zhang and K.Y. Liu	437
Strong Consistency of Maximum Likelihood Estimators in Sequential-Cumulative Logit Model C.M. Yin, X.J. Li and D. Fu	445
On the Almost sure Convergence Rate for Weighted Sums of Negatively Associated Random Variables with Application to Priestley-Chao Estimate G.J. Huang and G.D. Xing	449

Chapter 5: Mechatronics, Industrial Robotics and Control Technology

Remote Wireless Control System of Copper Refinery Shorting Switch Y.L. Bai, B.X. Xu, S.S. Hu, X. Wang and H. Feng	455
---	-----

Solution for Radio Frequency Identification Conflict Y.F. Dai and Y.C. Dai	460
Preliminary Electromagnetic Design Expert System for Surface-Mounted Permanent Magnet Brushless Machine H. Zhang and Y.J. Zhang	464
A High Torque Magnetorheological Brake with Three Effective Areas J. Wang, J.Q. Li and Z.W. Gao	470
A Method for Controlling the Permanent Magnet Linear Motor with the Counterweight by Pneumatic Cylinder S. Chen, D.B. Zhao and Y.W. Wang	477
A Precision Compensation Method for Space Manipulator Trajectory Planning Based on Particle Filter Y.F. Wang, H.X. Sun, G. Chen and Q.X. Jia	485
A Survey of the Current Status of Force-Feedback Manipulator J.Z. Song, G.J. Wang, H.X. Sun and Q.X. Jia	491
Adaptive Switch Control of Synchronizer for Dual Clutch Transmission H.K. Li, T.L. Lu and J.W. Zhang	500
An Accurate Mathematic Model for PMSM by Taking Total Losses and Saturation into Account F. Qiao and Z.Z. Liu	505
Analysis on Numerical Simulation for Bionic Robot Fish Based on CATIA D.J. Li	511
Anti-Windup Variable Parameter PD Controller Design for Ballistic Missile F. Song, H.C. Zhao and Y.X. Mei	516
Modal Analysis on Linear Ultrasonic Motor L. Luo and Q. Luo	522
Modeling of the Electro-Hydraulic Actuator for a Dual Clutch Transmission H.T. Hao, T.L. Lu, J.W. Zhang and B. Zhou	525
Research on the Modeling and Simulation of Power System for the Single-Axle Parallel HEV Q.X. Zhou, S.H. Cao and T. Ning	531
Research on the Rehabilitation Robot Control Methods for Analysis of Lower Limb Kinetics during Sit to Stand Process K. Liu, J.C. Zhao, E.G. Cao and X. Han	535
Servo Controller Application and Design in ATP System X.H. Li, X. Xiang and X.G. Du	540
Study on Control System of SCM Palletizing Robot Arm J.X. Diao, R.Y. Hou and H.D. Hu	546
Study on Optimization of Control Parameters for the Second Cycle during Forward Rotation Direct-Start Process at a GDI Engine W.X. Sun, W. Hong, F.X. Xie and Y. Su	551
Synchronization of a Class of Uncertain Time-Delay Chaotic Systems H. Chen and Y.J. Ji	556
The Analysis of Free-Floating Space Manipulator when Tracking Desired Force/Position L. Zhang, Q.X. Jia, G. Chen and H.X. Sun	560
The Workspace Analysis of an Improved 6-DOF Parallel Handcontroller J.Z. Song, G.J. Wang, H.X. Sun and Q.X. Jia	567
Trajectory Planning for a Articulated Robot K.K. Wang, J.Q. Li, Y.W. Zou, C.L. Wang and L.B. Liang	576
Water-Saving Monitoring System Design Based on LabView Simulation Platform J. Shu, H.H. Liao and Y.F. Xu	582
Speed Sensorless Control System Based on MRAS Z. Jiao	586
Obstacle Avoidance of Omnidirectional Intelligent Wheelchair Based on Multi-Sensors X.Z. Li, Z. Liu and S.M. Jia	590
Experimental Evaluation of a Dual Piezostack-Driven Jetting Dispenser System J.C. Jeon, S.M. Hong, J.U. Chung and S.B. Choi	594

A Mitigation Method for Temperature Error Based on MEMS Gyroscopes Array S. Li, X.F. He, M.P. Wu and X.P. Hu	598
Research on the Key Technologies for Establishing the Finite Element Model of a Gyro-Stabilized Platform X.L. Yang, L.J. Qin, F.X. Huang and W.J. Guo	603
The Characteristics of Frustum of Cone Parachute-Airbag for Aircraft Recovery System W.H. Xie, B. Zhou, E.X. Liu and Y.G. Zhang	608
Method of Fuzzy Adaptive PID Algorithm Applying to Engineering Practice Z.H. Yin	612
Research of Three Anti-Lock Braking Control Algorithms to Enhance the Effect of Vehicle Directional Stability J. Li, X. Yang, Z.H. Wang and H. Miao	618
The Design of Laboratory Management System Based on Embedded Video and Campus Card L. Zhu, X.L. Wang, P.P. Zhang, H.X. Ma and L.X. Wei	625
Geometric and Motion Error Model and Precision Analysis of Multiaxial EDM M. Wang, Q. Zhou, J.Y. Liu and L.J. Zhai	631
The Network Long-Distance Supervisory System Based on Web D.Y. Huo and Y. Wang	636
Research on Warehouse Environment Monitoring and Control System Based on Multi-Sensor Data Fusion Y.W. Wang, T.H. Li, J.J. Bi, H.Y. Li and G.Y. Li	640
Research on Measures to Improve Stability of the Power System X.F. Shi and S.G. Mu	648
Research of Distribution Automation System FA Function Test Method Y.M. Qian, P. Li, L. Su and G.T. Guo	653
Analysis of Electromagnetic Field in Auto Starter Based on Ansoft J. Li and W.B. Shu	658

Chapter 6: Information Technologies, Computer Networks and Communication Technology in Automation

Discussing on Vehicular Ad Hoc Networks Simulation Y.F. Dai and Y.Y. Zou	665
A Bandwidth Allocation Strategy for Train-to-Ground Communication System of Urban Mass Transit X.W. Zhang and H.H. Dong	669
Joint Beamforming and Power Optimization with Per-Antenna Power Constraints in Cognitive MISO System W.T. Zhu, X. Liu and J.B. Yang	674
Research on Networked Collaborative Technical Service Based on Cloud Computing T.R. Zhang and T.B. Yu	679
Study on Cloud Service Evaluation Index System Based on QoS C. Cheng and A.Q. Chen	683
The Development of PaaS Based on Cloud Foundry J.X. Du and X.D. Sun	688
User Activity Based Application-Layer DoS/DDoS Attack Defense Algorithm Y.L. Tsien and R.L. Gai	693
Large Scale Motor Group Integrative Management and Control Network System Based on PLC-SCADA under Complex Environment L.M. Zhao and B. Zhang	698
Intelligent Operation and Maintenance of Substations Based on Internet of Things (IoT) Technology Y.B. Wang, Z. Wang, D.Y. Zhao and H.F. Zhang	708
A Heterogeneous Cross-Domain Authentication Model Based on Access Tickets in Virtual Cable Television Network Y. Wang and Y.L. Wang	717

Design and Development of the Mass Image Storage Platform Based on Hadoop X.Q. Zhou, J.X. Sun and X.X. Luo	721
Design on Text Retrieval Algorithm in Cloud Computing Environment H.X. Tian, X.W. Cui, J. Wang and Y.J. Wang	726
Multi-Tag RFID Identification and Anti-Collision Algorithm J. Wang, H.X. Tian, X.W. Cui and Y.J. Wang	730

Chapter 7: Electronic Devices and Electrical Circuits for Mechatronics and Control Systems

A Novel Parameter Optimization Platform of Dynamic Reactive Power Compensator for Composite Power Load J. Li, J. Chen, Y.X. Yuan, X.S. Zhou and Y.F. Wang	737
Leakage Power Reduction in 32-bit Digital Comparator Using Modified Power Gating Technique G. Amuthavalli, R. Gunasundari and A. Nijandan	741
Study on the Measures to Prevent Hump Section Midway Switch G.R. Wu	745
The Design Optimization of Si-Based Isotope Microbattery Z.J. Cheng, C.W. Huang and P. Zhou	748
The Research and Design of the Adaptive Automotive Headlamps Based LED System X.S. Zhao and S. Bai	753
The Theoretical Analysis and Optimization of the Fuel Injection Drive Circuit for Diesel Engine J.G. Bu, M. Zhou, G. Dong and G.S. Feng	758
The Dielectric Resonator Antenna with Good Electrical Properties and Special Shape for Camouflage C. Zhou, R.H. Yang, R.Y. Xu, G. Liu, Y.J. Yan, D. Qu and Y.W. Fan	768
Research on some Key Mechanical Properties of Silicon Nitride Thin Films Deposited by PECVD Q.F. Yang, J.Y. Zheng, J.Q. Wang, J.H. Lin, X.N. Zhao and G.F. Zheng	773