Table of Contents

Preface and Committees

I. Precision Measurement	
Precision Force Measurement Using the Levitation Mass Method (LMM) Y. Fujii, A. Takita, J. Kaewkhao, M. Djamal and T. Yamaguchi	1
Application of Autoregressive Distributed Lag (ADL) Model to Thermal Error Modeling on NC Machine Tools	0
E.M. Miao, X. Wang, Y.T. Fei and Y. Yan	9
Design and Application of Natural Audio Electric Field Frequency Selecting Instrument X.Y. Liao, H. Cheng and Y.C. Bai	15
Application of the Mine Multi-Wave Seismograph in the Measurement of Coal Seam Washout Zone	
Y.B. Hu, Y.Q. Wu, H.Q. Kang and G.H. Fu	20
Designing Multisine Excitations for Measurement of Modern Wireless Communication System	
X.Y. Yuan, H. Fang, X. Zhou and G.C. Shou	25
An Evaluation Method of Roundness Error Based on Artificial Bee Colony Algorithm X.J. Wu, D. Hao, R.R. Fu and C. Xu	30
Nano-Displacement Measurement with Grating Interference M.L. Jiang, F.P. Li and X.D. Wang	35
Studies on the Influence of the Frame Structure's Deformation of the Automatic Hydraulic Tile Press on Energy Consumption Z.C. Huang and Z.L. Li	41
Coarse North-Finding Based on Tracking Inversion Points Method without Torque L.H. Fu, G.M. Dong, L. Feng and Y.C. Lin	46
Coordinate Transformation of Laser Tracking in-Site Measurement System for Big Gears M.Y. Guan, M.L. Dong, L.Q. Zhu, Y.K. Guo and Q.S. Chen	51
Study of the Light Source Affects the Second Order Moiré Fringe Quality of Nano-Grating X.S. Ma, X.J. Sun, W.H. Zhong and H.W. Guan	57
Novel Method for Extracting Body Boundary from Measured Point Cloud of Helical	
Surface Y.K. Guo, Z.K. Pan, H. Meng, L.Q. Zhu and P.Y. Wang	63
Proposal of Intelligent Inventory System for Space Station with IC Tag - Near Real-Time Onboard Inventory Management	
K. Shimada and Y. Fujii	68
Measurement of Mass Attenuation Coefficients of Blue Sapphire at Different Photon Energy by Compton Scattering Technique	
J. Kaewkhao, P. Lofimkitjaroenporn, S. Tuscharoen, T. Kittiauchawal, W. Chewpraditkul and P. Limsuwan	71
Laser Doppler Velocimetry with Small Wavelength Sensitivity Using Planar Lightwave	
Circuit K. Maru and Y. Fujii	76

82

87

92

97

II. Optical Measurement and Image Processing

Data Registration Method Based on Three Dimensional Target

Slider Curvature Control through Dicing Process C. Srisang, K. Siangchaew, J. Kaewkhao, A. Pokaipisit and P. Limsuwan

J. Kaewkhao, N. Srisittipokakun, K. Kirdsiri, C. Kedkaew and P. Limsuwan

X.F. Yi and S.C. Long

Melting Temperature

X.P. Lou, N.G. Lv, P. Sun and Y.M. Lin

Precision Displacement Measurement of Single Lens Reflex Digital Camera

Optical and Physics Investigation of Fe₂O₃ Doped in Soda-Lime Silicate Glass at Different

Slant Detection and Correction of Mobile Phone Keyboard Image C.J. Peng, Q.C. Zhao and G. Huang	102
Image Sparse Representation Based on a Nonparametric Bayesian Model X.H. Ding and X.B. Chen	109
Polygon-Division Method to Measure Wound Area of Human Body Surface B.M. Zhang and G.H. Fu	115
Research on a Novel Indoor Localization Method for Mobile Robot Y. Luo, W.X. Kong, Y. Zhang and T.W. Wei	119
Temperature Compensation of Long Period Fiber Grating with Negative Strain Coefficient W. Wang, B.J. Zhang and X.H. Yin	124
A SLAM Model Based on Omni-Directional Vision and Odometer Y.Q. Wang and Y.H. Li	128
Testing and Analysis of High-Speed Camera for Pulse MIG/MAG Welding Droplet Transition	10.4
Y.M. Wen, S.S. Huang and G.X. Liu Research on LED Lighting Secondary Light Distribution by Using a Freeform Lens	134 138
Z.F. Hu, J.W. Mao and Y. Luo Measurement for Naked-Eye-Stereoscopic Display Vision Character F.Y. Liang, J. Wang, F.Z. Liang, J.X. Niu, J. Chen, H. Zhang, H.C. Chen, R.H. Zhang and G.L. Xiong	138
Auto-Multi-View Stereoscopic Technology F.Y. Liang, J.X. Niu, J. Wang, J. Cheng, Z.C. Tie, F.Z. Liang, H. Zhang, X.P. Liu and H.C. Chen	147
Super-Resolution Analysis on Molten Pool Image of Metal Active-Gas Welding Based on Wavelet with Fractal G.Z. Dai, G.Q. Han and C.Y. Dong	152
Analyzing the Two-Dimensional (2+1) REMPI Spectra of Bromine and Carbon J. Zhang and J.G. Ma	158
Visual Detection of Moving Vehicles Ahead Based on the Characteristics H.Y. Yu and W.G. Zhang	165
New Target 3D Pose Determination Method Based on Straight Line Character Y.C. Xie, Z.G. Li and Y.C. Lin	170
Design and Analysis of Dual-Beam Heterodyne Interferometer A.S. Ju, Y.B. Zhang and W.M. Hou	177
A Method Based on Two Constraints for Camera Calibration Interior Parameters Y.F. Du, M.L. Dong, J. Wang and P. Sun	181
Functional Watermarking Algorithm Based on Contourlet Transform and ECC Y.L. Peng, Y.G. He and B. Lin	187
Research on Edge Detection of Thin Sheet Part Dimension Inspection System Based on Machine Vision	
J.G. Wu, K.F. He and B. Qin	194
III. Numerical Simulation and Signal Analysis	
The Numerical Simulation and Experiment Research for Measurement of Error Vector Magnitude (EVM) H. Fang, X. Bian, X. Zhou and K. Liu	199
Investigation on the Transmission Efficiency of the Planetary Gear Train L.F. Chen, X.L. Wu, D.T. Qin and Z.J. Wen	205
Spiral Flow Capability Research in the Rotary Cylinder S.B. Li and Y.L. Liu	209
Research on Multi-Link Dynamic Aggregation Model of Cloud Computing Network H.Y. Ju	214
The Design Research of Single-Chip High Power LED Radiator Y. Luo, T.W. Wei, Z.W. Tang and W.X. Kong	219
The Research Based on Empirical Mode Decomposition in Bearing Fault Diagnosis T.L. Xu, X.Z. Lang, X.Y. Zhang and X.C. Pei	225
Remote Status Monitoring and Fault Diagnosis for Manufacturing System T. Zan, M. Wang, J.Z. Hu and X. Liu	229

A Method Based on Data in Application of Distributed Control System Modeling H.W. Guan, Y. Li, Y.D. Li and S. Li	234
The Simulation of Adaptive Fuzzy PID Control System on the New Test Power Source System of Small Locomotive Z.M. Cheng, X.D. Guo, X.K. Chen and J.X. Deng	240
The Corresponding Numerical Analysis of Dike Typical Diseases and Electrolog Data Q.M. Zhang, S. Xu and Y.B. Leng	246
Novel Method for ELISA Traces Pipetting System by Air Displacement Pipetting L.Q. Zhu, H. Li, Y.X. Na, Y.K. Guo and M.L. Dong	252
O-Shape Board Topological Optimal Design in the Thickness Measurement System S.Y. Yang, H.Q. Liang, G.Q. Hou and P.Y. Zhu	257
The Distance Attenuation of Acoustic Emission Signals in Turbine Runners X.H. Wang, H.W. Hu, Y.M. Shao and J.Q. Fu	262
CFD Study on the Flow Characteristics in Filleted Microchannels H.J. Yan, P. Zhou, Z.L. Xu, Z. Chen and J.W. Mo	268
KPCA Denoising and its Application in Machinery Fault Diagnosis L.L. Jiang, Z.Q. Deng and S.W. Tang	274
Research of Direct Sequence Spread Spectrum Communication System Based on MATLAB X.J. Li, Z.C. He and Q. Li	279
Noise Source Localization Investigation in High Speed Train Based on Microphone Array X.F. Zhang, Y.G. Xiao and H.L. Deng	285
IV. Precision Metrology and Calibration	
Study on a Micro-Force Generated Mechanism for Sensor Calibration Y. Wang, J.H. Sun, Z.S. Liu and H.J. Liu	292
Development of a Novel Two-Axis Force Sensor for Chinese Massage Robot J.Q. Ma and A.G. Song	299
Study on a Moisture Measurement Method Based on Microwave Attenuation Z.L. Li, Z.C. Huang and Y.J. Huang	305
Displacement Sensor with Controlled Measuring Force and its Characteristics Analysis L.E. Yang, X.Z. Wang and L. Zheng	309
A Multi-Scale Self-Correction Method for Leaking Current of Insulator in Electric Transmission Line X.B. Hong, G.X. Liu, J.L. Xu and S.D. Wu	314
Design and Implementation of Software System for Large-Scale Coordinate Measurement Based on the Laser Tracker	
Z.L. Zhang, J. Yuan, W.H. Zhou, Y.W. Wang and Y. Xu Application Study on a Detecting Tube for Deformation Settlement Monitoring for Earth	320
Dike Based on Distributed Optical Fiber Sensors P.Y. Zhu, H. Lei and Y.B. Leng	327
Ontology Construction of Size Limitation in New Generation of GPS L.J. Ji, Y.R. Zhong, H. Meng and X. Xia	332
Ontology Construction on ISO 286 Fit H. Meng, Y.R. Zhong, L.J. Ji and X. Xia	338
Application of Data Visualization and Numerical Analysis for Evaluating Propagation of Uncertainty	2.12
X. Bian, X. Zhou, H. Fang, K. Liu, X.C. Gan, H.N. Zhao and Y. An The Design of Test System for Comprehensive Performance of Clutch Booster	343
Z. Luo, Q. Luo, W.J. Fan, Y. Lu and B. Guo Design of a Self-Tunning Temperature Controller for a Coal Sample Burning Point	348
Detecting Instrument X.Y. Chen, C.Y. Dong and G.Z. Dai	354
Problems about the Evaluating System of the Pixel Luminance Uniformity of LED Display Using a Digital Camera F. Zou and S. Chen	361
Uncertainty Evaluation Study of CMM Dynamic Measurement Based on Quasi Monte Carlo Method	501
W.H. Zhong, X.S. Ma, Y.D. Li and Y. Li	366

Research and Simulation of Robot Trajectory Planning in Joint Space X.P. Hu and F.Y. Zuo	372
Error Analysis of the Illuminance Meter Verification System	312
F. Zou and J.W. Wang	378
Analysis of the Measurability Requirement for Weaponry W. Jiang	383
V. Precision Control	
Permanent Magnet Linear Synchronous Motor Servo System Based on DSP	388
D.Q. Hao, L.Q. Zhu, Z.K. Pan, Y.K. Guo and Q.S. Chen Development of General Embedded Intelligent Monitoring System for Tower Crane	300
H.L. Deng and Y.G. Xiao	394
Control and Optimization of Negative Pressure in Scrap Copper Smelting Y.D. Li, W.H. Zhong, H.W. Guan and X.S. Ma	399
Mathematics Modelling of Hobbing Gear with Arbitrary Tooth Profile and Investigation H.R. Hu, S.M. Luo and L. Chen	404
A Radius Correction Method Called 4 Points Co-Sphere and its Application in Screw Rotor	
Detecting P.H. Hu, Z.Q. Zhou and Q.C. Zhao	410
The Design of Automatic Smooth Layer System for the Construction Elevator Based on Fuzzy Control	
J.J. Zhu, L. Ma, C. Chen and X. Feng	417
Disquisition of Performance Testing Equipment for Vacuum Booster W.J. Fan, L.B. Jin, Y. Lu and B. Guo	422
The Function Realization of Vehicle Computer Q. Xing, L.L. Li and J. Fang	427
The Implemented of Information Accessibility Human-Robot Interaction System Based on	
Data-Glove Y. Zhang, X. Li and Y. Luo	431
Design of the Resonator for Microwave Moisture Instrument Z.L. Li, J.G. Si and Z.C. Huang	438
VI. Measurement and Analysis for Material and Machining Processing	
Aluminum Hot Finishing Rolling Process Parameters on the Effect of Temperature Field	
Distribution Z. Fu, Y.L. Liu and X. Liu	442
Measurement and Analysis on Dynamics Cold Crystallization Parameter of High-Density	442
Polyethylene (HDPE) Sheet by Vibration Force Field B. Li, X.M. Qin and B.S. Shi	447
The Graphical Solution of Transverse Asymmetry Parameter Relationship in the Rolling	77 /
Stage X.Q. Zhao, Y.L. Liu and S. Huang	452
The Effects of Deoxidants on Ge-Se-Te Chalcogenide Glasses	
X.S. Wang, J. Sun, Q.H. Nie, S.X. Dai, X.H. Zhang, B. Bureau, C. Boussard and C. Conseil	458
Acoustic Emission Monitoring Technology Used in the Ceramics Grinding Cut Depth Control	161
M. Wang, T. Zan, L. Hu, J.Z. Hu and X.Y. Zhang Experimental Modal Analysis of Motorized Spindle Based on Stochastic Subspace	464
Identification	460
J. Meng and X.A. Chen Research on the Dynamic Loading Method of High Speed Spindle	469
J. Meng	475
Kinematic Characteristics Research of the Superfine Particles in the Superfine Vibration Mill	
G.N. Tang, M. Peng, W. Liu and D. Ren	480
Tail Deviation Mechanism and Neural Network Control of the Tandem Rolling Strap	

Study on Dynamic Measure Experiment of Four-Bar Linkage with Clearances Y.C. Yuan, J.F. Cai and C.C. Jing	493
Development and Industry Outlook of Crushing Technology F.S. Mu and Y.L. Liu	498
Tribological Performance of Pulse Electroplated Ni-P/BN(h) Composite Coatings C.Z. Peng, L.L. Zhu and S.W. Tang	504
Preparation of Mo (Si, Al) ₂ by Microwave Assisted Combustion Synthesis S.W. Tang, J.H. Yan and C.Z. Peng	509
VII. Measurement for Medicine and Security and Geography Repeated-Evaluation Genetic Algorithm for Simulating Social Security in the Artificial Society	
Z.Q. Ye and X.Y. Yu An Improved Maklakoff's Method for Measuring the Intraocular Pressure-Volume Relationship J.G. Ma and J. Zhang	513 518
Assessing Desertification with Soil Indicators in Agro-Pastoral Transition Zone of Northern Shaanxi	
J. Zhang and P. Hou	525
An Improved Method for Estimating the Seismic Intensity Based on Grey System Theory J. Tong, J.H. Fu and Z.Y. Wang	531
Research and Development of Electric Control System of Friction Coefficient Test Vehicle for Airport Runway C.H. Zhou, W.Y. Zhang and Y. Wei	536
Design of Wireless Real-Time Tracking E-Tickets Based on WIFI J. Feng, R.J. Ding and Z.Y. Xia	541
3D FEM Modeling and Simulation of Resistivity Imaging on Embankment R. Wang, Y.B. Leng and Y. Zhou	545
Simulation and Application on the Adaptive Fuzzy PI Control in Low-Rise Elevator Speed Regulation System J.X. Deng, X.D. Guo, X.K. Chen and Z.M. Cheng	550
The Corresponding Theory Study of Dike Typical Diseases and Electrolog Data Q.M. Zhang, S. Xu and Y.B. Leng	556
Chemiluminescence Immunoassay Analyzer Control System Based on S3C2410A X.Z. Yue, L.Q. Zhu, H. Meng, Q.S. Chen and Y.X. Na	563
Design Model of the Tunnel Axis and its Algorithm Implementation Y.Q. Li and Y.K. Liu	570
Ethernet Private Line Access Design Scheme H.F. Tian, Y.H. Liu and Y.H. Li	578
Intelligent Displacement Measuring System for Rock Stratum F.L. Li, J.H. Rong and Y.P. Zhang	583
Theoretical Analysis of Magnetic-Electric Prospecting Method for Piping and Seepage Detection of Dyke G.H. Fu and T.C. Yang	587
VIII. Measurement in Social Life	
Measurement in Social Life - Toward More Efficient User Interface S. Seiichi and A. Yamawaki	592
Development of Position Detector with Large Sensing Area Using Frosted Glass Y. Kitazono, K. Miyata, S. Nakashima, L.F. Zhang and S. Seiichi	600
A Monitoring System to Prevent Forgetting to Take Medicines on Time Using Funnel-Shaped Sensors Y. Kitazono, T. Matsumoto, S. Nakashima, S.Y. Yang and S. Seiichi	606
Development of Non-Contact Type Chewing Sensor Using Photo-Reflector Y. Kitazono, S. Ono, S. Nakashima, M. Miyauchi and S. Seiichi	611
Development of a Heart Rate Measurement Method Using Body Conduction Sound Sensor E. Fumiaki, T. Toshiaki and K. Tanaka	616

Person Localization System Using Privacy-Preserving Sensor S. Nakashima, H.M. Lu, K. Miyata, Y. Kitazono and S. Seiichi	622
A Method for 3D Sphere Detection Using one-Dimensional Histogram and Polytope Method S. Nakashima, H. Nakamoto, Y. Kitazono, L.F. Zhang and S. Seiichi	628
Extraction of the Region Feasible for Safe Ambulation from Head-Mounted Wearable Camera Images Employing Genetic Algorithm on Homography Constraints H. Orii, K. Tominaga, H. Kawano, H. Maeda and N. Ikoma	633
Building Facades Extraction from on-Vehicle Camera Images in a Graph-Cut-Based Optimization Framework H. Kawano, H. Orii, Y. Fukuda and H. Maeda	641
Decorated Character Recognition Employing Modified SOM Matching T. Masuhara, H. Kawano, H. Orii and H. Maeda	649
Character Detection and String Identification on a Signboard in Scene Image Based on Criterions of Segmented Images H. Kawano, H. Orii and H. Maeda	658
A Hybrid Method of Information Embedding for Digital Watermark L.F. Zhang, Y.J. Li, S. Nakashima and S. Seiichi	667
Actual Image Effect Creation According to a Real Lens Imaging System L.F. Zhang, H.M. Lu, Y. Kitazono and S. Seiichi	673
Time-Divided Computer-Generated Holograms for the Construction of Spatial Continuous Laser Light Distribution S.Y. Yang, T. Hora and S. Seiichi	679
Detection of Multiple Moving Points with a Position Sensitive Device Using Modulated Light Targets S.Y. Yang, K. Matsura and S. Seiichi	683
A Wearable Supporting System for Visually Impaired People in Operating Capacitive Touchscreen	083
A. Yamawaki and S. Seiichi Proposal of Fast Implicit Level Set Scheme for Medical Image Segmentation Using the	687
Chan and Vese Model H.M. Lu, S. Seiichi, Y.J. Li, L.F. Zhang, S.Y. Yang and X.L. Hu	695
An Improved Method for CT/MRI Image Fusion on Bandelets Transform Domain H.M. Lu, S. Nakashima, Y.J. Li, L.F. Zhang, S.Y. Yang and S. Seiichi	700
A New Image Segmentation Method Based on Improved Fast Implicit Level Set Scheme in X/γ-Ray Inspection System Y.J. Li, H.M. Lu, L.F. Zhang, S.Y. Yang and S. Seiichi	705
Development of Stationary User Interface Using Head-Tracking K. Miyata, Y. Kitazono, S.Y. Yang and S. Seiichi	711
Co-Occurrence Matrix-Based Statistical Model for Texture Analysis from Images H. Shahera and S. Seiichi	717