# Table of Contents

Preface and Organizing Committee

## Chapter 1: Applied Mechanics and Measurement Technology of Detection and Monitoring

**Study on the Method of Crack Detection of Steel Rods Based on Modal Analysis**  
H.C. Sun, Y.C. Deng and Y.C. You  
[3]

**Detection System for Scratch on the Wheel Tread of Train Based on PSD**  
P. He, Y. Li, Y. Guo and P. Li  
[9]

**Effects of Time Dependent Temperature and Thermal Radiation on Free Convection Flow in Unsteady Couette Motion**  
M. Narahari and N. Yahya  
[15]

**Numerical Simulation of Stress Wave Propagation Induced by Cut Blasting in Multi-Media**  
G.L. Yang, R.S. Yang, C. Huo and Y.L. Che  
[22]

**Quantifying Fractal Dynamics of Metallogenic Systems with Detrended Fluctuation Analysis**  
L. Wan, P. Chen and Z.X. Gong  
[26]

**Bottom Dead Center Repeat Precision of High-Speed Press Measurement**  
X. Zheng, J.L. Wang and J.L. Yao  
[31]

**Research on Fatigue Life of Autofrettaged Thick-Walled Cylinder in Probabilistic Fracture Mechanics**  
A.J. Chen, Z.C. Cha and Z.Q. Wang  
[36]

**Numerical Analysis of Ice Accretion and Icing Effects on Airfoils**  
B. An and W.M. Sang  
[40]

**Identification and Reconstruction of Cracks in Ultrasonic Infrared Thermography**  
F.Z. Feng, C.S. Zhang, Q.X. Min and P.C. Jiang  
[46]

**Study of the Parameters of Deep Drawing Process Based on the Simulation of Dynaform**  
Q.W. Qu, T.K. Sun, S.Q. Wang, H.J. Yu and F. Li  
[51]

**The Simulation and Sensitivity Analysis of S-Lay Installation in Deep Water**  
L.P. Sun, D.J. Wang, S.M. Ai and X. Zheng  
[59]

**Finite Element Analysis of Elevator Link Stress Based on Pro/E and ANSYS**  
J.P. Wang, H.T. Wang and Z.F. Bao  
[65]

**Quantitative Analysis of Transverse Cracking of Rail Using Eddy Current Non-Destructive Testing**  
Z.L. Song, T. Yamada, H. Shitara and Y. Takemura  
[70]

**Convergence Study on Application of the Over-Deterministic Method for Determination of Near-Tip Fields in a Cracked Plate Loaded in Mixed-Mode**  
L. Šestáková and V. Veselý  
[76]

**Numerical Simulation Studies on Surface Erosion of Transmission Line in Sand and Dust Conditions**  
G.R. Hua, X. Xiao, Q. Xiao and H.Y. Wang  
[82]

**Experimental Study on Measurement Accuracy of Prediction Index $K_1$ for Rock Crosscut Coal Uncovering**  
Y.J. Chen and C.L. Jiang  
[88]

**Temperature Drift Compensation Algorithm Based on BP and GA in Quartzes Flexible Accelerometer**  
X.F. Li, D.H. Li, J.M. Gao and M.S. Pang  
[95]

**Buffeting Prediction of a Square Cylinder with Inflow Turbulence**  
Z. Liu  
[100]

**A Practical Method to Calculate Elasto-Plastic J-Integral**  
Y.H. Li, X.L. Bai and Y.W. Zhao  
[104]

**Real-Time Detection of Adhesion Coefficient between Tire and Road**  
[109]
b  Applied Mechanics and Mechanical Engineering III

Research on WALKER Constitutive Model Tangent Modulus
Y. Chen, Q.W. Wang and Q. Shan 113

Flow Microsensor of Thermal Type for Measurements of Gas Fluxes
O. Sazhin 118

A Study of Air Flow through Perforated Tile for Air Conditioning System in Data Center
J. Priyadumkol and C. Kittichaikarn 126

The Evolution Equation for Wave Processes of the Shift Deformation
Y. Ivanova and V. Ragozina 132

Structural Damage Detection by Integrating Non-Negative Matrix Factorization and
Relevance Vector Machines
S.M. Zhou and Y.Q. Bao 137

The Sufficient Condition for the Existence of Periodic Solution of Certain Three
Dimensional Nonlinear Dynamical Systems
J. Li, T.T. Quan and X.D. Jin 147

Combination Method of Kernel Principal Component Analysis and Independent
Component Analysis for Process Monitoring
Y.W. Xiao and Y. Du 153

Grid Validations for Downburst Simulations
H.X. Dang, F.L. Yang and J.B. Yang 159

Semi-Orthogonal Binary Spline Wavelets in Incompressible Fluid Dynamics
S.W. Chan, K.F. Lai and M. Syed 164

Two-Dimension Temperature Field Reconstruction in Furnace by Acoustic Method
L.N. Jia, Y. Gao and D.C. Lu 170

Tilt Error Analysis and Compensation for Two-Position North Determining Scheme in
FOG North-Seeker
R.Z. Pei, D.H. Li and K.K. Duan 175

Locomotive Characteristics of Body and Limb in a Terrestrial Vertebrates
S.H. Park and D.P. Hong 180

UGNX8.0 Multi-Axis Machining Technology in Impeller Design and Programming
Simulation Processing Application
Y.Y. Chen, X.L. Ma and Y. Zhang 189

Measurement of Blood Pressure and Heart Beat Based on Sensors and Microcontrollers
I. Morsi and Y.Z.A.E. Gawad 193

Numerical and Experimental Investigation on the Weighing System of an Incubator Shaker

Design of a LabVIEW System Applied to Predictive Maintenance
M.H. Mathias, E.C. de Medeiros and V.D. Gonçalves 208

Drum Sludge Drying Equipment Energy Dissipation Factor Analysis
X.L. Ma and Y. Zhang 213

The Design about Aiming at Amount of Change from Baseline Detector with Characteristics
of High-Resolution
J.S. Wang, Y.C. Zhao and Z.Y. An 218

Density-Based Distributed Elliptical Anomaly Detection in Wireless Sensor Networks

Interstellar Autonomous Navigation System Using X-Ray Pulsar and Stellar Angle
Measurement
Y.D. Wang, J.F. Sun and W. Zheng 231

Recognizing Check Magnetic Code Based on Peak-Valley Location and Amplitude
D. Fan, Z. Chen, C.C. Bu, Z.S. Yang and J. Li 241

Wireless Gas Detector System Using Microcontrollers, PLC and SCADA System for
Monitoring Environmental Pollution
I. Morsi and M.M.M. Mostafa 247

Chapter 2: Mechanical Engineering, Manufacturing Technology and Application
Suppressing Chatter in a Plunge Grinding Process: Application of Variable Rotational Speed of Workpiece
Y. Yan and J. Xu 259

An Efficient Model for Trust Force Dynamic Analysis in Drilling of CFRP/AL Stack
H. Cheng, Y. Li, K.F. Zhang and B. Luo 263

An Optimal Selection Model of the Satellite Lurk Orbit
X.K. Zhang, Y.K. Gong and J.H. Qu 270

Dynamic Responses of Vehicle-Track-Foundation System under Axial Loads
H.L. Zhu, L.F. Yu, E.N. Yuan and X. Wang 274

Thermodynamic Performance Analysis of Ammonia-Water Rankine Cycles Using Heat Sources of High and Low Temperatures
K.H. Kim, H.J. Ko and S.W. Kim 278

Effects of Repair Weld on Residual Stress Distributions in Offshore Pipelines
M. Zeinoddini, S. Arnavaz and S.A. Hoseini 284

Research of Dynamics Simulation of a Six-DOF Segment Erector for Tunnel Boring Machine
G. Li, B. Wang, Y.D. Chen and W.S. Wang 291

Experimental Investigations on Characteristics and Welding Forces in Friction Stir Welding of AA 6061-T6 Aluminum Alloy
Q.X. Wang, J.G. Yang and L.L. Ding 295

The Application of Hasofer-Lind Method in Reliability Design of Thin-Walled Cylindrical Shell

Statistical Energy Analysis of Wind Noise in High-Speed Train Cab
X.Y. Yang, Y.G. Xiao and Y. Shi 307

Kinematic Model of Mobile-Cylinder Engine
S. Fedorenko, A. Nikiforov and V. Fedorov 314

A Method to Test Holding Force of an Electrode Tab-Clamp for Lithium-Ion Battery Formation
C.H. Ding and P. Liu 321

Research on the Sufficient Condition for the Existence of Periodic Solution of FGM Subjected to Aero-Thermal Load
J. Li, X.N. Yin and X.D. Jin 326

Residual Stress Prediction for High Speed Machining
S.Y. Lin and S.H. Cheng 332

Slip-Slope Estimation of Mutative Road Friction Coefficient Based on Unscented Particle Filter
F. Lin and C. Huang 337

Stress Analysis and Safety Prediction of Alloy Wheel Hub
W.X. Qian, X.W. Yin and L.Y. Xie 343

The Refined Equations of Special Orthotropic Piezoelectric Plate-I: Anti-Symmetrical Transverse Surface Loadings
B.S. Zhao and D. Wu 348

The Refined Equations of Special Orthotropic Piezoelectric Plate-II: Symmetrical Transverse Surface Loadings
B.S. Zhao and D. Wu 352

Analysis of Contacting Mechanical Characters Based on Cyclical Symmetrical Theory
D. Zhao 356

A Coupled Fluid-Structure Simulation for Variable Displacement Pump Used in Vehicle

Characteristics of Self-Synchronization of Dual-Rotors System
N. Zhang 366

The Simulation Application for the Structure Design of the Etcher Nozzle
L. Sheng 372

Design Method of the Advanced Actuator
C.P. Zou and J.Q. Feng 378

Innovation of the Advanced Actuator
C.P. Zou and J.Q. Feng 382
Study on Inversions of the Offset Planetary Train with Bevel Gears  
C.P. Zou and J.Q. Feng 386

Steady-State Load Analysis of a Caterpillar Chassis by Finite Element Method  

Green NC Transformation of Lathe C6132 Based on the Green Manufacturing Process  
Y.H. Fu, R.Y. Zhang and Y. Xu 394

Data-Driven Based Gas Path Fault Diagnosis for Turbo-Shaft Engine  
F. Lu, T.B. Zhu and Y.Q. Lv 400

The Study of Electromagnetic Slip Clutch Application in Step Less Speed Regulation of Small Cars  
R.X. Bai, J. Zhu, J.G. Dong and S.C. Chen 405

Improved Design and Dynamic Simulation of High Aspect Ratio Folding Wings  
S.L. Lv, P. Liu, G.J. Yang and X.Y. Tong 410

Manufacturing Information Model for Design for Manufacturing  
H.J. Liu, Q.M. Fan and T.X. Yan 415

Two Layer Fuzzy Generalized Maxwell-Slip Compensator in Direct Drive Servo Hydraulic System  
P. Guansak, D. Kogphimai and W. Po-Ngaen 420

Large Eddy Simulation of Two-Phase Mixing Layer Flows in the Scramjet  
Z.X. Ren, B. Wang and H.Q. Zhang 428

Investigation for Convective Heat Transfer on Grinding Work-Piece Surface Subjected to a Mist/Air Impinging Jet  
J.Z. Zhang, X.M. Tan, B. Liu and X.D. Zhu 434

Investigation on Convective Heat Transfer over a Rotating Disk with Bottom Wall Subjected to Uniform Heat Flux  
J.Z. Zhang, X.M. Tan and X.D. Zhu 443

Numerical Simulation of Impinging Jet with Mist Injection  
X.M. Tan, Y.F. Li and J.Z. Zhang 452

Effects of Centrifugal Pumps Outlet Angle on Flow Induced Vibration and Noise  
Y. Wang, J. Wang, D.X. Liu and H.L. Liu 460

Preliminary Research of Manufacturing Technology for ITER Magnet Supports  
B.L. Hou, P.Y. Li, S.J. Yang and C.J. Pan 466

A Numerical Study of an Injection-Compression Molding Process by Using a Moving Grid  
B.A. Dwiyantoro 472

The Control of Hydrogen Flow in Keeping with Load Changing at the PEMFC  
Y.G. Jung, C.M. Hwang, D.H. Park, K.H. Kim and C.H. Han 477

Neural Network and D-S Evidence Theory Based Condition Monitoring and Fault Diagnosis of Drilling  
J.P. Wang, S.D. Lin and Z.F. Bao 481

Evaluation of a Three-Parameter Equation in the Multiaxial Fatigue Life Prediction  
Y. Xiong and L.X. Cheng 487

Effects of Droplet Size on Transient Behavior of after Fogging Process  
K.H. Kim, C.H. Han and Y.G. Jung 493

Analysis on Thermal-Fluid-Solid Interaction of Straight Pad Finger Seal Performance  
C. Chang and S. Hua 498

Theoretical Analysis and Experiment of Super Hybrid Rice Seeds Embryo Oriented Based on Arc-Shaped Guided Plate  
Y.X. Yu, B. Zheng and Y.Y. Yang 505

The Influence of Speed on the Performance of Centrifugal Pump  
H.M. Zhang, G.J. Li and D.M. Peng 512

A Numerical Study on the Influence of Grooves on Heat Transfer Performance of Wet Clutch  
Y.L. Lei, J.T. Wen, X.Z. Li and C. Yang 517

Development of Connecting Rod Three-Dimensional Parametric Design System  
K.X. Guo, H. Tang and Q. Cao 523

Numerical Simulation of Non-Equal Diameter Cylinder  
G.J. Yang and J. Sun 527
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology Based Knowledge Processing in Condition Based Maintenance System</td>
<td>G.Y. Jin, F.Z. Lv and Z.Q. Xiang</td>
<td>533</td>
</tr>
<tr>
<td>Three-Dimensional Structure Modeling in Tuo128 Block of Shengtuo Oilfield</td>
<td>H.B. Zhao, X. Li, F.H. Wang and Y.B. Cui</td>
<td>563</td>
</tr>
<tr>
<td>A Kind of New Switching Power Supply with Multiple Isolated Outputs Used in High-Voltage Static Synchronous Compensator</td>
<td>B.J. Yan, A.D. Xu and Z.Y. Bai</td>
<td>567</td>
</tr>
<tr>
<td>Application of Generalized Predictive Control to a Peristaltic Pump</td>
<td>G.F. Hu and L.G. Chen</td>
<td>572</td>
</tr>
<tr>
<td>Comprehensive Evaluation for Safety Working Status of Hoisting Mechanism of Crawler Crane Based on 3-Scale AHP</td>
<td>G.N. Xu and P. Li</td>
<td>583</td>
</tr>
<tr>
<td>Dynamic Characteristic Analysis and Experiment of Piezoelectric Vibration Table of Industrialized Precision Seeding Device</td>
<td>S.F. Chen, L.Y. Hou and S.P. Zhang</td>
<td>604</td>
</tr>
<tr>
<td>Design and Research on Variable-Rate Fertilization Computer Control System</td>
<td>S.F. Chen, C.L. Feng and S.P. Zhang</td>
<td>610</td>
</tr>
<tr>
<td>Design and Experiment on Paddy Hydraulic Drive Variable-Rate Fertilization Device</td>
<td>S.F. Chen, Z. Zhao and C.L. Feng</td>
<td>616</td>
</tr>
<tr>
<td>Modeling and Analysis of Brake by Wire System in Electric Vehicle</td>
<td>L.Y. Yu, W.Z. Zhao and J.B. Yi</td>
<td>622</td>
</tr>
<tr>
<td>The Iterative Method for Reliability Estimation of Fatigue Life</td>
<td>X.L. Bai, P. Xu and J.Y. Li</td>
<td>628</td>
</tr>
<tr>
<td>Reliability Estimation of Fatigue Life for Machine Parts under Uniaxial Constant Amplitude Load</td>
<td>Y.H. Li, X.L. Bai and Y.F. Zhang</td>
<td>632</td>
</tr>
<tr>
<td>Optimization of Two-Stage Closure Law of Turbine Wicket Gates and its Application</td>
<td>S. Chen, J. Zhang and X.D. Yu</td>
<td>636</td>
</tr>
<tr>
<td>Study on Fatigue Performance of Large Volume Seamless Steel Cylinder Served in CNG Hydraulic Daughter Station System</td>
<td>H.L. Dong, Z.X. Duan, B.X. Li and D.Y. Wang</td>
<td>642</td>
</tr>
<tr>
<td>Shape Optimization of High-Speed Train Pantograph Insulators for Low Aerodynamic Noise</td>
<td>X.Y. Yang, Y.G. Xiao and Y. Shi</td>
<td>646</td>
</tr>
<tr>
<td>Discussion on Solving Systematic Matrix for Linear System of Invariant Time</td>
<td>C.H. He and Z.H. Yin</td>
<td>652</td>
</tr>
<tr>
<td>Numerical Simulation and Experiment of Motion of Rice Seed in Pneumatic Seed-Metering Device</td>
<td>Y.X. Yu, Y.Y. Yang, B. Zheng and F. Zhang</td>
<td>657</td>
</tr>
<tr>
<td>Analysis of Ring Compression Test for Determination of Friction Circumstances in Forging Process</td>
<td>M. Dehghan, F. Qods, M. Gerdrooeei and J. Doai</td>
<td>663</td>
</tr>
</tbody>
</table>
Research on Vehicle Chassis Integrated Control Technology Based on Coordination Strategy  

Research on Stochastic Stability of Wheelsets with Primary Suspension  
W.W. Liu and H.Y. Dai 672

The Union Algorithm of Rolling Stocks’ Kinematic Envelope  
H. Dong and R. Luo 678

Vibra-Acoustic Characteristic Matching of Mini-Car Body Structure and Interior Acoustic Cavity in Low Frequency Range  
Q. Wang, Y. Yu, Y.B. Li, S.K. Li and W.J. Zheng 685

Thermal Analysis of Cold Plate for Motor Controller Based on Fluent  
G.L. Lin, G.Q. Xu, W.M. Li and B.B. Liu 691

The Optimum Windshield-Defog and Passenger-Comfort Methods of a Vehicle in all Seasons  
K.L. Wong, W.L. Chen and Y.C. Li 696

Design of a Cutting Point Control Algorithm for Five-Axis Machining  
C.H. She and T.H. Yang 702

Study on the Mechanical Characteristics of an Electrode Tab-Clamp for Lithium-Ion Battery Formation  
C.H. Ding and N. Feng 707

Heat Dissipation and Temperature Distribution of Brake Liner Using Steady State Analysis  
M.P. Natarajan and B. Rajmohan 712

Application of Micro Capillary Groove Radiator to Electric Vehicle Power-Control Unit  
B.B. Liu, G.Q. Xu, W.M. Li and G.L. Lin 718

An Experimental Study on Cycle Performance of the Mobile Air Conditioner with and without Indoor Fan Operation  
Y.C. Park and J. Kim 725

A Comprehensive Approach for Resistance Spot Welding Quality Estimation Using Dynamic Resistance Based Model  
A. El Ouafi, R. Belanger and M. Guillot 732

Research on Electric Weft Insertion Method for the Rapier Loom  
Y. He, S.W. Fei, Y.C. Chen and B. Wang 739

Novel Scanning Immersion Lithography for 3D Microfabrication  
Y.C. Chen and S.C. Tseng 747

Topology-Preserving Transformation Based on the Correspondence of Control Points Using Radial Basis Functions  
X. Yang and S.S. Fan 752

Stability Analysis and Numerical Simulation of the Conical Tower of the Wind Turbine  
X. Song, Y.G. Wu, H.Z. Li and J.X. Dai 759

The Practical Use and Method for Diagnosing Roller Axle Troubles on Site  
S.S. Chen 765

Analysis on the Finite Element of Electromechanic Coupling of Flexible Gear in Electromagnetic Harmonic Drive  
Y.B. Ren and L.Z. Xu 771

Multi-Axle Electro-Hydraulic Control Steering System Based on Servo Solenoid Valve  
H. Du, J.H. Wei, B. Hu and J.H. Fang 778

An Analytical Study on Thermally Induced Vibration Analysis of FG Beams Using Different HSDTs  
S. Mareishi, M. Mohammadi and M. Rafiee 784

Finite Element Resistivity Forward Modeling Using Algebraic Multigrid Preconditioned Conjugate Gradient Method  
G.H. Zou and H.Q. Liang 792

Simulation and Experiential Research for Broken-Conductor Load of Suspension Towers of UHVDC Power Transmission  
Z.F. Zhang, Z.L. Mo and J.D. Geng 798

Chapter 3: Advanced Materials Science and Engineering
Force Propagation of Flow of Granular Materials through an Orifice in Start up Stage
H.P. Zhu, B.S. Xia and A.B. Yu 807

Control Problems for the Models of Thermally and Electrically Conductive Viscous Fluid
R. Brizitskii and D. Tereshko 812

A Comparative Experimental Investigation of 3D Angle-Interlock Woven Composite between Quasi-Static Tension and Three-Point Bending Loading Conditions
F. Zhang, L.M. Jin and B.Z. Sun 818

Finite Element Model Analysis of 3-D Angle-Interlock Woven Composite under Quasi-Static Tensile Loading
H.J. Hu, L.M. Jin and B.Z. Sun 823

Kinetic Study on Photopolymerization of TPGDA under Containerless Condition
H.P. Zhang, Q.Y. Zhang, J.B. Dou and S. Xu 828

Development of Approaches to the Creep Process Modeling under Large Deformations
E. Murashkin and M. Polonik 833

Spectral Element Model for the PZT-Bonded Laminated Composite Beams
U. Lee, I.W. Park and I.J. Jang 838

Study on UV Curable Waterborne Polyurethane Modified by Epoxy Resin
W.Y. Li, Y.M. Cao and X.Q. Zhou 842

A Strain Sensing Structural Health Monitoring System for Delaminated Composite Structures
A. Alaimo, A. Milazzo and C. Orlando 849

Damage Detection of Filament Wound Composite Cylinder Using Ultrasonic Waves
L. Gu, K.Z. Gong, G.Y. Gao and Z. Li 856

Constitutive Modeling of Flow Behaviour of AISI 4340 Steel under Hot Working Conditions
A. Sanrutsadakorn, V. Uthaisangsuk, S. Suranunthchai and B. Thossatheppitak 863

Inhibition Effect of Sodium Molybdate on Friction Stir Weld of 5083 in Aqueous Solution
C.B. Shen 870

Fracture Finite Element Analysis for Roll Forming of U Section Parts of TRIP 600 Steel
Y.Z. Guan, Q. Li and Y. Yan 874

Optimization of Elastic Supports for Laminated Composite Plates
J. Kong 881

Research on Debonding Damage of Adhesive-Bonded Composite Integrated Structure
G.Q. Yuan and Z.X. Chen 887

Transient Plasma Ignition for Delay Reduction of Ethene-Air Mixtures
L.W. Duan and Y.J. Hong 893

Oxidation Behavior of Reheating Hot Work Die Steels
J.U. Choi and H.S. Lee 896

A Study on Failure of Welded Lap Joints in Alloy 718

An Analytical Modeling for Effective Thermal Conductivity of Multi-Phase Transversely Isotropic Fiberous Composites Using Generalized Self-Consistent Method
S.A. Hassan, H. Ahmed and A. Israr 904

Several Models for Piezoelectric Composites
R.Y. Dou, Z.X. Huang, Z. Chen, J. Dai and M.X. Shi 910

Microstructure of the Acid Welding Slag
Y.B. Zhang and K. Zhang 914

Leaching of Heavy Metals from Municipal Solid Waste Incineration (MSWI) Fly Ash Using Nitric Acid
H.Y. Zhang and G.X. Ma 918

Leaching of Heavy Metals from Municipal Solid Waste Incineration (MSWI) Fly Ash Using Sulfuric Acid
H.Y. Zhang and G.X. Ma 922

3-D Elastic-Plastic Constitutive Relationship of Mixed Hardening
Z.Y. Wu, X.L. Bai and B. Ma 927

Surface Plasmon Interference with Two-Slit Metal Structure
G.Y. Duan, G. Song and L. Yu 931

The Investigation of Terahertz Metamaterials by Normalized Power Transmission
J. Luo, Y. Chen, S.W. Kang, X.Y. Zhang, C.S. Xie and T.X. Zhang 935
Sintering Characteristics of Micro-Zn Paste Containing Sn-3.0Ag-0.5Cu Nanoparticles
S.S. Chee and J.H. Lee 939

Fabrication of Spherical Bi Particles during Polyol Synthesis Using a Bismuth(III) Carbonate Precursor
J.H. Kim and J.H. Lee 945

Investigation on Impact Performance of Light-Weight Composite Honeycomb Sandwich Panels
I. Yutaka, T. Machida, M. Kobayashi and J.M. He 949

Finite Element Analysis and Shape Optimization of Aluminum Alloy Automobile Energy-Absorbing Components
Y.J. Liu, L. Ding, Q.F. Li and D. Wang 954

Influence of Nanostructured Fibers on Properties of Building Composites
N.V. Makarova, V.P. Pogodaev, A.V. Pogodaev, A.V. Kozin and A.S. Lipovoy 958

One-Dimensional Temperature and Stress Distributions Associated with Hyperbolic Heat Conduction
B. Wang 962

Nondestructive Reliability Monitoring of Zirconia Degraded under Hydrothermal Condition
C.Y. Choi and J.W. Byeon 968

Research on the Pressure-Measuring Uncertainty of Standard Copper-Cylinder
L.P. Li, D.R. Kong, F. Wang, L.X. Yang and C.R. Zhao 972

“Internal” Resistivity and Quantum Efficiency in Organic/Hybrid Solar Cells
H.L. Kwok 978

Interaction of High Power Laser with Carbon Doped PVC
D.K. Wang and Y.J. Hong 983

The Burst Tests and Theory Analysis of CFRP Pressure Vessel

Humidity Sensing Property of Al-Doped Mesoporous Silica
W.C. Geng, L.B. Duan and Q.Y. Zhang 992

Chapter 4: Rock, Civil and Structural Engineering

A New Method to Estimate Routine Based on the Motion Modes of Rockfall

Simulation Research of Blasting Vibration Prediction with Cylindrical Dynamite
G.L. Yang, R.S. Yang, C. Huo and Y.L. Che 1008

Estimation of Ultimate Limit State for Stiffened-Plates Structures: Applying for a Very Large Ore Carrier Structures Designed by IACS Common Structural Rules
H.C. Do, W. Jiang and J.X. Jin 1012

Study of Civil-Plane High-Lift Model Using Omni-Tree Cartesian Grids
C. Xi and W.M. Sang 1019

Research on Modal Parameters Identification of Wing Structures with NExT-ERA
Y.N. Guo and F.Y. Wan 1025

Mutation Instability Model of Perilous Rock and Calculation Methods for Corresponding Dynamic Parameters

Study on Wavelet Denoising of Pulse Impact Force of Non-Viscosity Debris Flow

Monitoring and Analysis of Blasting Vibration of Diversion Tunnel Excavation in Layered Rock Mass

Structure Analysis of Microbe-Repaired Concrete Using Scanning Electron Micrographs

Structural Post-Fire Behaviour of the Steel I-Shape Beams-to-Cylindrical Columns
M. Zeinoddini, S.A. Hosseini, M. Daghigh and S. Amavaz 1057

Numerical Analysis of Anti-Impact Performances of the Reinforced Concrete Slab
Q. Ma, D. Wu, X.D. Shi and X.G. Jiang 1063
Numerical Simulation of the Rock Fragmentation Process Induced by TBM Cutters
G. Li, B. Wang, Y.D. Chen and W.S. Wang

Experimental Investigation about Dynamic Bond-Slip between Reinforcing Steel Bar and Concrete
W. Yao, H.J. Wu and F.L. Huang

Smoke Transport Calculation during a Wooden Residential Structure Fire
C.S. Lin, C.C. Yu, T.C. Chen and G. Bui

Nonlinear Probabilistic Analysis of the Reinforced Concrete Structure Failure of a Nuclear Power Plant Considering Degradation Effects
J. Králik

Study of the Three-Dimensional Global Limit Equilibrium Method Applied to the Stability of Rock Slope
Y.S. Huang and J.L. Li

On Problems of Mechanical Properties of Structural Steel in Load-Carrying Structure of Historical Building Construction
M. Karmazínová and J. Melcher

Study on the Physics and Mechanical Properties of Freeze-Thaw Soil and Undisturbed Soil
H.M. Wang and Y. Wang

Evidence Theory and Differential Evolution for Uncertainty Quantification of Structures

The Application of an Immune Clonal Selection Algorithm Based on the Information Entropy in Truss Structure Multi-Objective Optimization

Construction of Hazardous Waste Management
H.Y. Zhang and G.X. Ma

Chapter 5: Control, Electronic, Automation Technology and Communication Engineering

Microcontroller System for Oil Refinery Parameters Measurements Based on Piezoresistive and Strain Gauge Pressure Sensors
I. Morsi and L.M.E.D. Rasheed

High Precision Ultrasonic Ranging System for Mobile Robot Navigation
Y. Gao, L.N. Jia, B. Wang, L.H. Liu and L.M. Huang

Calibration of the Wireless Unit of Micromechanical Accelerometers
A. Timoshenkov, V. Kalugin, S. Timoshenkov and A. Mikheev

Real-Time Identification and Tracking of Infrared Markers Based on Kalman Filter
Q.N. Xing, D.Y. Yan, X.M. Hu, J.Q. Lin and B. Yang

Automatic Integration of System-Level Design and System Optimization Based on SysML
Y.S. Liu and W.Q. Yuan

Integration of System-Level Design and Detailed Design Models of Mechatronic Systems Based on SysML and Step AP 203 Standard
Y.S. Liu and H.R. Fan

The EKF Sensorless Control Strategy of Permanent Magnet Synchronous Motor Adaptive Backstepping Control System
Y. Ji

Conservativeness Judgement of Controller for Systems with Time-Varying Delay
J.Y. Deng, H.F. Deng, J.B. Xiong and Q.R. Wang

Significant Factors Identification for Particle Swarm Optimization Algorithm to Solving the Design Optimization Problem of a Four-Bar Linkage for Path Generation
C.K. Lee and Y.C. Cheng

Design of PLC Timer System Based on ARM + FPGA
L. Yu, K.J. Li, Q.Z. Cai and S.G. Zhou

Application of CNC Programming Technology in the during of Processing for the Key Parts of Disappearing Mould

Joint Source and Relay Optimization of Multiuser MIMO Relay System
F.N. Chen and Z.P. Wang
Typical Product Cases Guided Engineering Graphics Teaching Reform for Communication Engineering Major
T.X. Zheng 1205

The Forecasting of the Development of Home Automation

The Design of Household Appliances Controller in Smart Home
M.Y. Mao, Y.H. Jiang and Z.C. Chen 1214

Research and Realize of High Availability in Femto Communication System
Z.Y. Shi, B. Xu and L.F. Huang 1219

Stability Analysis for Discrete-Time Markov Jump System
M.W. Li, Y. Chen and X.H. Zhang 1224

Research on the Method for Intelligent Autonomous Vehicle to Distinguish the Road in Virtual Traffic Environment
N.Y. Yang 1228

Embedded Micro Inertial Navigation System
K. Daniec, K. Jędrasiak, R. Koteras and A. Nawrat 1234

Development of Tool Inquiry System Based on Embedded RFID Middleware
N.F. Ren, Y. Li, J. Zhang and X.J. Wang 1247

Speech Emotion Recognition Based on Mixed MFCC
P. Zhou, X.P. Li, J. Li and X.X. Jing 1252

Design of a Multi-Thread Data Collection System
S.Z. Hu 1259

Developing of Environmental Noise Control
H.Y. Zhang and G.X. Ma 1264

Chapter 6: Biomechanics Technology

A New Dimension in the Study of Human Functional Joint Instability
W. Liu, T. Jain and C. Wauneka 1271

Optical-Tracker-Based 3D Reconstruction for Endoscopic Environment
B. Yang, Y. Zhou, X.M. Hu, J.Q. Lin and Q.N. Xing 1277

A Study on Image Representation Method Based on Biological Visual Mechanism

Cloning of the High Alkaline Endoglucanase Gene from Bacillus pumilus AC-4 and Expressed in E.coli
Y. Lin, X.Z. Li, J.W. Gao, J. Xu and C. Du 1289

Biomechanical Analysis in Human Masticatory System
L. Wang 1294

Review on Biomechanical Simulation, Measurement and Control of Orthodontic Force
Y.F. Liu, G. Zhou and S.S.Y. Liu 1301

Characteristic Parameters of Surface Electromyography Signals of Cervical Muscles
L. Wang, H. Wang, R.R. Fu and N.N. Zhang 1308

Modeling of Temperature in Orthopaedic Drilling Using Fuzzy Logic
R.K. Pandey and S.S. Panda 1313