

Table of Contents

Preface and Organizing Committees

Chapter 1: Materials Science and Materials Processing Technology

Structure Transition and Electrocaloric Effect of $\text{Pb}(\text{Zr}_{1-x}\text{Ti}_x)\text{O}_3$ at High Field W.J. Feng, Z.G. Zhang, C. Wu and H. Chen	3
The Study of the Appropriate Reclamation Method for the Complete Reclamation of the Used Clay Sand Q.Z. Sun, J. Wang, P.Q. Zhang, Z.K. Zhao and L. Jin	7
The Process Adaptability Study under the Conditions of Reclaimed Clay Sand Variable System Q.Z. Sun, L. Jin, P.Q. Zhang, Z.K. Zhao, J. Wang and J.G. Yan	11
Structural and Optical Properties of $\text{Ti}_{1-x}\text{Fe}_x\text{O}_2$ Nanoparticles L.A. Alkhtaby	16
Preparation and Characteristics of the Micro/Nano Fibrils from the Wheat-Straw Treated by Enzyme C. Liu, Y. Zhang and Y. Su	20
Controlling the Chemical Composition of the Interface Thermally Grown Oxides to Prolong the Lifespan of Thermal Barrier Coatings Based on Interfering Aluminum Diffusion Mechanism Y.J. Han and F.X. Ye	25
A DSC Investigation of the Effects of Cold Deformation and Low Temperatures Aging on the Microstructural Stability of a Peak Aged (PA) Al 6061 Alloy A. Hayoune and N. Titouche	32
The Strain Distribution and Equilibrium Morphology for Dome-Shaped Ge/Si Semiconductor Quantum Dot W.M. Zhou, L. Gao, C.Y. Cai and S.Y. Yin	39
Effect of Ball Milling Rotate Speed on the Properties of Quartz Sand Powder Materials Z.W. Wang, Z.W. Qiu, Y.P. Feng, T.T. Xie, J.Y. Chen, Q.Q. He, L. Zhao, J.F. Zhou, X.B. Wan, X.C. Chen, Q. Li, X.D. Ma, J.G. Song and W. Fu	47
Application of Dispersibility Mechanism for the Dispersibility of ZrB_2 Powder Materials in the Liquor J.G. Song, X.Q. Wang, M.H. Xu, S.B. Li and G.C. Ji	51
The Classification Mechanism of ZrB_2 Powder Materials via the Sedimentation Method J.G. Song, M.H. Xu, A.X. Chen, F. Wang and D.M. Du	56
Enhanced Diamond Nucleation by Surface Texturing of Si Substrate in SF_6/O_2 Plasmas J.C. Park, O.G. Jeong, S.Y. Kim, T.G. Kim, J.K. Kim and H. Cho	61
Thermal Degradation and Water Absorption Behaviors of Oil Palm Fruit Bunch (OPFB) Fiber and its Composites A. Kalam, N.N. Ahmad and K.M. Hyie	66
Dynamic Preisach Hysteresis Model for Magnetostrictive Materials for Energy Application G.L. Rocca, V. Franzitta, A. Viola and M. Trapanese	72
The Angular Distribution of Scattering Intensity and Polarization for Nano-Graphite Aggregates H.X. Wang, H.H. Sun, D.Z. Liu and Z.B. Song	78
Deposition of High Quality (Ti,Al)N Hard Coatings by Computer Automation Ion Plating S.S. Zhao, W.C. Lang and R.M. Yan	82
Recovery of Metal Values from Spent Lithium Primary Battery S.M. Shin, D.W. Lee, C.Y. Kang and J.P. Wang	86
Numerical Simulation and Parameter Optimization of Hot Pushing Elbow Pipe Bending Process X.Y. Lu, Q.T. Zhou, L.L. Huang and J.M. Liu	92

Forming Process and Mechanical Properties of Fiber Reinforced Polymer Concrete for Elementary Machine Parts W.F. Bai, P. Yin and S.C. Yan	98
<i>In Situ</i> Measurement of Electrical Resistivity of Ocean Sediments Containing Gas Hydrates Y.F. Chen, D.Q. Liang and N.Y. Wu	104
Energy and Economic Analysis of Different Buildings Constructed with Environmentally Sustainable and Traditional Materials V. Franzitta, A. Viola and M. Trapanese	109

Chapter 2: Applied and Computational Mechanics

New Mapping Solutions and Line Soliton Excitations in a (1+1)-Dimensional Dispersive Long-Water Wave System Y. Shi, B.K. Wang and S.H. Ma	117
Study of the New Solitary Wave Solutions and Periodic Wave Solutions of a Two-Dimensional Modified KdV Equation M.L. Gu, Z.H. Zhu and S.H. Ma	122
Hydraulic Fluid Mathematical Modeling P.C. Shi and Y.M. Sun	127
Kinematical Analysis of Slide Lever Linkage of 3rd Class E. Gebel and V. Khomchenko	133
Inverse Problems of Single Mode about Some Indeterminate Beams Q.S. Wang, M.H. Liu, L.H. Zhang and M. He	139
Shear Capacity of Hexagonal Masonry Walls with Hollow and Solid Blocks K.K. Chang and D.W. Seo	144
Damage Identification of Cantilever-Type Structures by Using Only the First Natural Frequency and Mode Shape Y.S. Chun and K.K. Chang	152
Non-Oscillatory Finite Compact Scheme for the Equations of Ideal Magnetohydrodynamics L. Liu and Y.Q. Shen	157
Research on Velocity and Inducted Magnetic Field of Conducting Flow in 2D Y. Liu, Y.G. You, Y.Q. Zhang and X.L. Cao	163
Coupling PSE and FLUENT to Predict Laminar-Turbulent Transition in Boundary Layers Y. Zhou and Y.H. Fang	168
Application of Homotopy Perturbation Method for the Generalized Burgers-Fisher Equation J. Yu and J.G. Huang	173
Modeling and Analyzing for Multi-Axis Wheeled Vehicle Handling Performance and Stability J. Li, S.H. Yuan, S.P. Lyu and D.M. Jyu	179
Some Opial Type Inequalities with Higher Order Delta Derivative on Time Scales L.Z. Li, M. Han, Y.Y. Liu and P. Wang	185
Numerical Investigation of Sub-Iteration Criterions for Unsteady Flow Computations with Dual-Time Method G.N. Li and M. Xu	189
Physical Invariant Constitutive Equation for Soft Tissues M.H.B.M. Shariff	196
Analytical Characterization of the Performance of Steel Heavy Clip Angle Connections Y.H. Joe, J.W. Kim, J.W. Hu and J.W. Seo	202
Design Check for the Steel Gusset Plate in Tension Using LRFD Method J.W. Hu and H.M. Jang	210
Thermoelastic Damping and Thermal Relaxation Time in Auxetics B.T. Maruszewski, A. Drzewiecki and R. Starosta	215
Implementation and Verification of High-Order Accurate Discontinuous Galerkin Method on 2-D Unstructured Grids W.G. Zhao and H.W. Zheng	221

Chapter 3: Engineering Researches, Design and Manufacturing in Mechanical Engineering

A Model for the Pull-In Parameters of Magnetostatic Actuators with Fringing Effect Y.M. Fang and J.J. Qie	229
Investigation of (G'/G)-Expansion Method and Exact Solutions for the (2+1)-Dimensional Calogero-Bogoyavlenskii-Schiff System G.H. Xu, S.H. Ma and J.P. Fang	235
Design of Wind Turbine Vibration Monitor Based on DSP + ARM Q. Wang and H.Z. Wang	240
Software and Hardware Design of a Acoustic Fault Detecting Instrument H.W. Wang, X.N. Wang, X. Tian, G.H. Du, Y.M. Tian, Q.M.S. Rong and W.K. Zhang	246
Analysis of the Quality of Rapid Manufacturing Technology Based on the Silicone Rubber Mold X.F. Chen, J.H. Du and H.W. Li	253
Corrosion Mechanism on Offshore Wind Turbine Blade in Salt Fog Environment X.H. Dong, T.J. Yuan and R.H. Ma	258
3-Phase 4-Wire VIENNA Rectifier Used in the Resistance Spot Welding Inverter Power Supply Y. Zhang, H. Teng, T.J. Ma, H.X. Xie and P. Wan	263
The Dynamic Research of Industrial Sewing Machines Based on the Modal and Operational Deformation Analysis Y.J. Li, L. Zhang, Y.M. Ma and B. Liu	269
Dynamic Characteristics of a Multi-Functional Bridge Bearing with Built-In Piezocomposite Element D.H. Ha, J.F. Choo, C.H. Lee, W.S. Jang and N.S. Goo	275
The Simulation Research of Damping Characteristics for the Underwater Vehicle Moving under or Exceeding Water C.F. Zhang, J.B. Gao, H.B. Lü, Z.J. Zhao and C. Wang	281
A Study on the Clearance Design of Fine Blanking Tool for Al Special Parts with Various Inner Corner Shapes J.D. Kim, Y.M. Heo and S.T. Won	288
Theory and Method for Simulation Evaluation of Accelerated Degradation Test Plan Based on Multiple Performance Parameters J. Pan, M. Wang, W.H. Chen and R.M. Xu	294
Automotive Engine Performance Testing System Based on LabVIEW G.F. Chen	300
Research on Rolling Element Bearing Fault Diagnosis Based on Singular Value Decomposition and Kurtosis Criterion X.L. Wang, Y.X. Zhang, J.P. Zhu and Z.Q. Shi	304
Subsystems Risk Assessment of the CNC Machine Tools X.C. Zhu, F. Chen, J.L. Wang, Z.J. Yang, L.D. Wang and Y.H. Jia	310
Innovative Hydraulic Power Take-Off Construction and Performance Tests for Wave Energy Conversion J.C. Antolín-Urbaneja, J. Laso, P. Estensoro, I. Cabanes and M. Marcos	316
Design and Test of a Thermomagnetic Motor Using a Gadolinium Rotor V. Franzitta, A. Viola and M. Trapanese	324
Hydrodynamic and Noise Characteristics Analysis of a Sea Valve and its Optimization H. Jin, X. Zhu, B.W. Deng, G.J. Zhang and J. Hu	330
A New Topology of Five-Level Neutral Point Clamped Inverter for Motion Control Systems D. Baimel and S. Tapuchi	336
A Theoretic Analysis Method Research of Load Appling Based on Response Control in Time Domain J. Hu	341
Novel Multilevel Hybrid Cascaded Inverter for High Power Motion Control Systems D. Baimel, S. Tapuchi and R. Rabinovici	345

Numerical Investigation on Boundary Layer Flow Control with Vortex Generators G.Y. Liu, R.B. Wang, C.R. Zhang, F. Chen, J.Y. Xie and S. Ma	351
Parametric Study in Thermal Optimization Design of Multi-Chip Module J. Zhang and D.L. Zhang	358
Radial Distortion Correction of Fish-Eye Lens Using Straight Lines J.E. Ha	364
Film Cooling Effect on the Nosetip in Hypersonic Flow T. Nie and W.Q. Liu	368
High Voltage Triggered Spark Gap with Repeatable Gas Filling Structure Z.X. Tian	373

Chapter 4: Biomedical Engineering

Study on Mechanics Behavior of Human Ear Sound Transmission Based on Nonlinear Constitutive Relation W.J. Yao and B.T. Luo	381
Analysis of Human Hand Kinematics: Reaching Upward Movement H.A. Rahman, G.C. How, Y.C. Fai and E.S.L. Ming	386
Computerized Assessment for Early Screening of Children with Handwriting Difficulty C.C. Neo, S.L.M. Eileen, K. Puspainayat and C.F. Yeong	392
Effects of Mechanical Stimulation on Viscoelasticity of Human Lung Fibroblast G.H. Wang and Y.P. Xie	398
Effect of Intermittent Haptic Disturbance in Motor Skill Training N.Z.A. Siti, S.L.M. Eileen and C.F. Yeong	403
Study on the Humanized Design of Medical Furniture J.J. Zhang and G.Q. Zhang	409
Preparation and Characterization of Tea Polyphenols/Starch Inclusion Complex L.M. Zhang, Z.Y. Hu, L.H. Yan, R.L. Li, C.W. Cao and X.D. Hu	413

Chapter 5: Control and Automation

Modern Motion Control Systems-State of the Art, Challenges and Industrial Applications D. Baimel and S. Tapuchi	421
Passive Angle-Only Maneuvering Target Tracking Using Federated Filter in Hybrid Coordinates L.W. Fong and I.H. Chen	427
A Radar Fault Diagnosis Expert System Based on Improved CBR H.Z. Cheng and X.F. Cheng	432
Object Manipulation Using Kinect as the 3D Sensor D.W. Kim and J.E. Ha	437
Intelligent Navigation of Assembly Stations Based on Real-Time Manufacturing Information T. Yang, Y.F. Zhang and J.Q. Wang	442
Design and Implementation of a Kind of Intelligent Electric Blanket Temperature Control System R. Li, Z.M. Duan, W. Zhou and B.C. Dong	447
Vision Recognition on Line Pattern Following Behavior on POB-Bot T.S. Ho, G.C. How, Y.C. Fai, T.W. Kang and E.S.L. Ming	453
Motion Control and Implementation of Glass-Curtain Cleaning Robot S. Cheng, J.L. Lu, L.D. Wang and J.W. Zhang	458
A Lyapunov-Based Control for a Single-Phase Shunt Hybrid Active Filter H. Cheng and C.W. Li	464
Design and Implementation of Fuzzy PID Controller for Brushless DC Motor Control System W. Fan and T. Chen	472
The Fuzzy CMAC Based on RLS Algorithm H. Cheng	478

Research on Production Process Control for Discrete Manufacturing Enterprise Based on Integration of MRPII/JIT/TOC D.P. Qiao and J.X. Geng	483
Smith-ADRC for Main Steam Pressure of CFBB X.L. Fu	489
Design and Development of an Omnidirectional Mobile Robot T.W. Kang, L.T. Yong, Y.C. Fai and E.S.L. Ming	494
Baffle Positioning System for Thomson Scattering Diagnostic on EAST T.F. Sun, Q. Zang, Q.S. Hu, X.F. Han, T.F. Wang, C.Q. Shao, H. Chen, J.H. Yang, A.L. Hu and Y.D. Li	500
A Novel LabVIEW-Based Automatic System for Deep-Water Hydrologic Sampling T.L. Xue and J.F. Xia	507
Using Smartphones as a Tool to Capture Road Traffic Attributes G. Guido, A. Vitale, F.F. Saccomanno, D.C. Festa, V. Astarita, D. Rogano and V. Gallelli	513

Chapter 6: Applied Computational Procedures and Algorithms

Dynamical Behaviors of Stochastic Hopfield Neural Networks with Reaction-Diffusion Terms Q.H. Zhou and L. Wan	523
Synchronization Analysis of Boolean Network C. Chen and W. Zhu	528
A Robust Algorithm for Digital Watermarking with Tamper Recovery C.M. Li	533
A Novel Algorithm for Digital Watermarking for Image Tamper Localization and Recovery C.M. Li	538

Chapter 7: Computer and Information Technologies

A Lightweight Message Encrypt Protocol for Electronic Commerce X.J. Zhong and L. Yao	545
The Application and Realization of Active Database in Computer Immune System M.M. Wu	549
The Research on Cluster Algorithm in WSN H.Y. Zhang, J. Zhu, Z.Y. Ma and H. Xia	555
Tensor-Based Web Services Discovery Model and its Algorithm H.M. Zhan and L.J. Zhang	559
Study on the Optimize Strategies of Gene Expression Programming X.W. Gao, B.B. Guan and X.J. Guan	565
The Research and Application of Short Message Name and Address Technology B. Jia	571
CSMA/CA Protocol for Wireless Sensor Network Based on Probability Function Detection M.C. Tan, H.W. Ding, Y.Y. Guo, Y.F. Zhao and H.B. Shao	575
The Asymmetric PCF Control Technology of Gated Service Based on Continuous-Time G.L. Zhao, H.W. Ding, Y.Y. Guo, Y.F. Zhao and Y.N. Hao	582
Face Image Feature Extraction and Feature Selection Y.M. Tian, Y.D. Zheng, W. Jin and G.H. Du	587
Design and Development of the Energy Management System in Cigarette Manufactures D.F. Zhu, J.J. Wang and H. Wang	592
Part Features Oriented Optimizing of Manufacturing Resources for Cloud Manufacturing Z.Y. Dong and L. Zhang	598
Research on Network Virtual Instrument D.W. Zhang and X.J. Xie	603
Design and Implementation of Intelligent Warehousing Management System Using Internet of Things X.J. Liu, Q. Liu, W.J. Xu, L.W. Yang, L. Fan and B. Chen	609

A Pairwise Key Pre-Distribution Scheme Based on OKS and Grids for Wireless Sensor Networks

Y.Q. Zhang and M. You

615

The Application of Database Connection Pool Based on Java in Things Networking

X.S. Jing and M.Y. Huo

622