

Table of Contents

Preface, Committees and Sponsors

Chapter 1: Mechanical Engineering and Mechanical System

Study on Mechanical Automation with Automatically Adjustable Seat Based on Mechanical Properties T.H. Fu	3
Analysis of Fatigue Damage for Offshore Wind Turbine Substructure B. Wang, Y. Li, J.P. Luo, D.S. Wang and S.X. Zhao	7
The Research and Design of Intelligent Battery Charger for Electric Vehicle Y. Zhao, E.Z. Hou and X. Fang	15
Finite Element Analysis of a Certain Heavy Vehicle Gear Box H.Z. Zhang, X.X. Zhang and S.L. Feng	19
Research on the Development of Agricultural Mechanical Automation in Mechanical Engineering H.W. Yang and L.Y. Zhang	23
Analysis of Working Condition and Load Direction for Tripod Substructure of Offshore Wind Turbine B. Wang, Y. Li, N. Lv, B.B. Zhu and W. Li	27
The Rotation Speed Control of DC Servo Motor Based on Fuzzy-PI Dual Mode Y. Yang, Y. Chen, H. Sun and J. Huang	34
Route Planning of Geomagnetic Aided Navigation for Vehicle under Matching Suitability Constraints P. Wang, X.P. Hu, M.P. Wu, H. Mu and H.P. Yuan	39
Risk Assessment of Gravity Dam with Machine Properties F.H. Li and H. Ma	43
Integral Sliding Mode Control Based on Exponential Approach Law for Brushless Double Fed Machines Z.R. Duan, G.Y. Huang, Z.K. Shao, J.D. Wu and X.D. Wang	48
Temperature Measurement Algorithm Research of Boiler Furnace Based on BP Network J.Y. Liu, J.Q. Yang and Y.B. Shi	53
Study on Influence of Divided Conductor with Mechanical Properties on Operating over Voltage in Power System W. Kang, L.X. Zhang and Y.J. Du	57
Based on the Mechanical Arm of the Polar Rescue Intelligent Control System L. Gao, S.M. He, S. Luan, M.S. Jin and J. Liu	62
Mechanical Design and Study on Showing Platform of Rotation and Vertical Reciprocation X.W. Jiang and Q.L. Du	66
Study on Mechanical Engineering for Flight with Flight Safety Evaluation Method on Relevance Vector Machine X.S. Gan, H.L. Cui and Y.R. Wu	70
Study Based on Hybrid Bounding Volume Hierarchy for Collision Detection in the Virtual Manipulator H.Y. Wu, Z.M. Shu and Y.G. Liu	74
Fault Analysis and Treatment of CNC Machine Tool Servo System Y.B. Shi and S. Yang	78
Research and Design of Walking Mechanism of Robot and the Parameterization Modeling Based on the UG H.Y. Wang and E.B. Peng	82
Study on Mechanical Properties for Modeling and Simulation of Microneedles for Medical Applications Y. Li and P.Y. Zhang	86

Extended NGM (1,1,K) Model and its Application to Spectral Prediction of Military Launch Vehicle Hydraulic System	
H.T. Wang, L.H. Gong, W. Zhao and H.F. Zhao	90
Study on Mechanical Wear State in Military Launch Vehicle Hydraulic System with Knowledge Discovery from Analytical Ferrography	
H.T. Wang, L.H. Gong, W. Zhao and H.F. Zhao	94
The Study of the Parameterization of the Drum Brake Design Based on UG	
H.P. Liu and E.B. Peng	98
Study on Error Analysis of On-Line Measurement System Based Numerical Control Process	
H.D. Ren and E.B. Peng	102
Fluorescent Sensors for Mg(II) Based on Phthalocyanine PcOC8	
L.H. Wang	106
Experimental Study on the Parameters of Service Life of Rolling-Bearings	
W.S. Hao	110
Study of the Kinematics for the Serial Robot on the Controllable Polishing Force	
M. Yu and X. An	114
Grinding Spindle Improvement Based on Structure Optimal Design	
P. Fu, J. Huang, M.Z. Jin, M.Q. Gong and X.N. Pan	118

Chapter 2: Civil Engineering and Applied Technologies

Research of Brittle Shear Failure Strength of Rock Materials	
Y. Li, Z. Li and T.J. Xu	125
Elasto-Plastic Analysis of Soil around Tubular Pile Based on Triple Shear Unified Yield Criterion	
X.Y. Luo	129
Numerical Analysis of Stratified Rock Slope Stability Based on 3DEC	
Z.D. Wang, L.M. Jiang, Y.Y. Xia, Y.Y. Pei and M.Q. Lin	133
An Analysis on Structure Type Selection and Optimization of the Formtraveller for Cantilever Construction	
X.Y. Liu and L. Li	140
Chlorine Salt to Sea Sand the Influence of Concrete Compactness	
W.J. Yuan and J.Z. Liu	145
The Application of Improved Efficiency Coefficient Method in Debris Flow Warning with Rock Technology in Civil Engineering	
X. Hu and G.Y. Huang	149
Application of Ultrafiltration-Reverse Osmosis System in Reclamation and Reuse of Port Sewage	
X.H. Wang and G.Y. Li	153
Application of Inorganic Ceramic Membrane in Wastewater Treatment I: Process Research and Parameter Optimization	
G.Y. Li, X.H. Wang and Y.J. Wei	158
Analysis of Light Gauge Steel Truss Girder-Profiled Steel-Light Concrete Composite Floor with Different Screw Distributions	
Y.Z. Yang, Z.J. Wang and W.C. Kong	163
Analysis of Evacuation Efficiency Based on Properties of Construction Materials with Seven Popular Space Combinations in Architecture Design	
H. Xu, P.F. Duan, Y.L. Huang and X.B. Zhan	169
Research on Evaluation Index System of Durability and Life Prediction for Concrete Structure	
S. Zhang, Y.N. Zhang and Y. Liu	175
Durability Evaluation of Concrete Structure Based on Fuzzy Extension AHP	
Y.N. Zhang and Y. Liu	179
Finite Element Analysis of Continuous Curved Box-Girder Bridge	
Q.Y. You	183

Modification of Pine-Wood/Formaldehyde-Urea Resin Composites Using Electron-Beam Radiation	
M.X. Zhang, J.W. Huang and N.Y. Wang	187
Heat Transfer Characteristics and Loading Performance of Ground-Source Heat Pump System Pile	
M.Y. Zhang, W.Q. Zhou and F.Q. Gao	190
Research on Removal Impurities from Vein Quartz Sand with Complexing Agents	
L.L. Zhong, S.M. Lei, E.W. Wang, Z.Y. Pei, L. Li and Y.Y. Yang	194
Measurement on the Influence Lines of Bridge Responses Corresponding with Moving-Load Position	
Z. Jun, Z.W. Zhou, M.K. Gou and C. Liang	200
Shaking Table Test of Steel Frame Structure in Sine-Swept Vibration and its Virtual Realization	
H.B. Liu, Q. Zhang and X.P. Liu	204
Effect of Carbonization Impact on Compressive Strength of Cement-Fly Ash Mortar Subjected to Freeze-Thaw Cycles	
X. Li, M.X. Li, X.M. Shen and H.Q. Yang	209
Effect of Type and Dosage of Activators on Strength of Repair Concretes	
L.F. Xue, J.L. Xu and J.F. Yi	213
The Strength Analysis of Bolts Used for Paraboloid Antenna under Wind-Load	
J. Zhang, X.Y. Chen and Y. Jiang	218
Study on the Shear Strength Parameters under Different Freezing and Thawing Cycles of Soil Slope in China	
H. Wu, Q. Ge and J.B. Tian	222
Experimental Study on the Pressure Characteristics of Gasoline Vapor Explosion under Weak Restrictions	
J.J. Liang, D.H. He, Y. Du, S. Liu and J.Z. Zhou	226
Experimental Study on the Process of Gas Explosion in a Narrow Pipeline	
J.J. Liang, S. Liu, X.S. Jiang, D. Wang and J.Z. Zhou	230
Microbially Induced Carbonate Precipitation in Sulphoaluminate Cement Mortar	
X.L. Yuan, S.H. Zhou, W.M. Hu and D.M. Liu	234
Analysis of Fans Activating Time on Smoke Control for Road Tunnel Fire	
X. Han, X.N. Li and B.H. Cong	238
Experimental Research on Mechanical Properties of Cement Based Composites PVA Fiber Reinforced	
W. Ouyang, G.L. Geng, M. Lin and X.Q. Yu	242
Biodegradability Enhancement of Papermaking Wastewater by Electron Beam Irradiation	
Y. Jiang, N.Y. Wang, J.W. Huang, T. Hu, M.X. Zhang, Y.F. Zhang and Y.G. Li	246
Comparative Study on Expansive Soil Steep Slope FRP Materials Bolt Support	
X.J. Liu	250

Chapter 3: Material Engineering and Application of Materials

Shape Memory Alloy Materials and Exercise-Induced Bone Injury	
J.W. Zhou, J.Y. Hou and Y.T. Shi	257
Research on Carbon Fiber Composite Materials and F1 Racing Automobile Design	
H.T. Yin, M.M. Lang and Y.N. Zhao	263
Experimental Study on Convection Heat Transfer Characteristics of Magnetic Nano-Refrigerant	
Z.J. Wu and S.Y. Yin	268
Crystal Structure of 3-Indolepropionic Acid	
L.H. Wang	272
One-Dimensional Chained Polymer Constructed by 3-Indolepropionic Acid and 2,2'-Bipyridinium	
L.H. Wang and Z.X. Ji	276
Comparison and Research of Thermocouple Measuring Temperature Curve and Theoretical Temperature Curve in Grinding	
R.B. Li and C. Cui	280

