## Machine Design and Manufacturing Engineering III

Selected, peer reviewed papers from the 2014 3rd International Conference on Machine Design and Manufacturing Engineering (3rd ICMDME 2014), May 24-25, 2014, Jeju Island, South Korea

von Peng-Sheng Wie

1. Auflage

Trans Tech Publications 2014

Verlag C.H. Beck im Internet: www.beck.de ISBN 978 3 03835 180 1

## **Table of Contents**

**Preface, Committees and Sponsors** 

## **Chapter 1: Materials Science**

Conversion of Strontium Hydroxyapatite Nanopowders to Porous Scaffolds for Bone Implant Application	
C.M. Mardziah, I. Sopyan, K.M. Hyie and N.R. Nik Roselina	3
Oxidation of Inconel 690 Alloys at 800-1000°C in Air S.Y. Park and D.B. Lee	7
Effects of TiC/TiN Contents and Sintering Temperatures on Microstructure and Mechanical Properties of Al <sub>2</sub> O <sub>3</sub> /Ti(C,N) Ceramic Materials M. Wang, J. Zhao and L.L. Wang	12
Residual Life Prediction for In-Service Pressure Vessels Containing Crack Defects S.J. Lin, W. Long and D.Q. Tian	17
Gases Effects for Synthesis ZnO Nanostructures Using Carbon Assisted D. Polsongkram, P. Chamninok, K.S. An and S. Pukird	21
Numerical-Experimental Comparison to Validate a Mathematical Model for the Determination of the Superplastic Material Constants G. Giuliano	25
Mathematical Modelling to Evaluate the Superplastic Material Constants by Bulge Test G. Giuliano	29
Corrosion Behavior of Electrodeposited CoNiFe Nanoparticles Immersed in Different Environments	
N.A. Resali, K.M. Hyie, M.N. Berhan, N.R. Nik Roselina and C.M. Mardziah  Clustering of Composite Protein Films and their Packaging Properties  Q. Lei, Y.T. Zhang, J.Z. Pan, J.Q. Bao and Z.Y. Huang	33 37
Study on Performance of 8YSZ Thick Gradient TBC J. Qin, G. Chen, Z.M. Du and Y.H. Jin	43
Study on Hydrothermal Process Variables Correlation to WO <sub>3</sub> Nanostructure through Design of Experiments (DOE) Approach A.A. Rashid, N.H. Saad, D.B.C. Sheng, K.Y. Lee, W.Y. Lee and Y. Noriah	47
Analysis of Micro-Crack Inducing Mechanism by Graphite in Bond Area in Laser Repairing Grey Cast Iron P. Yi, C.F. Fan, P.Y. Xu and C.X. Li	51
Investigation of Redox-Transmetallation Process for Coating of Gold(Au)-Shell on Nickel(Ni)-Core Nanoparticles	
N.R. Nik Roselina, A. Azizan, K.M. Hyie, C.M. Mardziah and Z. Salleh  A Study of Water Crystal Growing Based on Dilution and Succussion Theory of	55
Homeopathy Y.C. Hsu, Y.S. Liang and P.Y. Cheng	61
Sustainable Natural Bio Composite for FDM Feedstocks M. Ibrahim, N.S. Badrishah, N. Sa'ude and M.H.I. Ibrahim  Improving Engine Oil Brangerties by Disposition of head	65
Improving Engine Oil Properties by Dispersion of hBN/Al <sub>2</sub> O <sub>3</sub> Nanoparticles M.I.H.C. Abdullah, M.F.B. Abdollah, H. Amiruddin, N. Tamaldin, N.R.M. Nuri, M. Hassan and S.A. Rafeq	70
Inhibition Mechanism of Benzotriazole in Copper Chemical Mechanical Planarization J. Li, X.C. Lu and Z.B. Zhang	74
Dynamic Propagation Problems Concerning Symmetrical Mode III Interface Crack of Aluminum Alloys N.C. Lü, Q. Xiang, G.D. Hao and Y.T. Wang	79
Mixing and Characterisation of Stainless Steel 316L Feedstock for Waste Polystyrene Binder System in Metal Injection Molding (MIM)	
R. Asmawi, M.H.I. Ibrahim and A.M. Amin	83

## **Chapter 2: Manufacturing, Forming and Processing Technologies**

A.M. Xu, J.M. Gao, K. Chen, F.M. Chen and Z. Wang	89
A New Sample Selection Method for Testability Verification Experiment G. Liu and F. Li	95
Research on the Single-Model Stochastic Assembly Line Balancing Problems of Type-1: A Task-Oriented Enumerative Algorithm H.Y. Zhang, H.J. Liu, L.Y. Chen and L.Y. Li	99
Optimization of Surface Roughness in Micro-High Speed End Milling of Soda Lime Glass Using Uncoated Tungsten Carbide Tool with Compressed Air Blowing A.K.M. Nurul Amin, M.M.A. Nassar and M.D. Arif	103
Characteristics of Swirl Effervescent Atomizer Spray Angle Z.A. Ghaffar, S. Kasolang and A.H.A. Hamid	108
Position and the Size of Drawbeads for Sheet Metal Forming with the Finite Element Method	
K. Sena and S. Piyasin	112
Geological Adaptive Cutterhead Selection for EPB Shield Based on BP Neural Network L.K. Lin, Y.M. Xia, F. He, Q.S. Mao and K. Zhang	118
A New Incremental Sheet Forming Process Based on Layer Manufacture J. Liu	124
Study on Microstructure and Properties of Laser-MIG Hybrid Welding Joints for Ti-70	
Alloy M. Zhang, D. Yang and G. Chen	128
Non-Melt Ultrasonic Bonding Method for Polymer MEMS Devices Z.B. Zhang, Q.Q. He and C.Q. Yan	133
Manufacture of Model Apollo Capsule Utilizing Pulsed-Plasma Jet for Bow Shock Dispersion G. Matsoukas and N.A. Ahmed	139
Changing Deformation under the Machined Surface in the Cutting Zone for the Different	
Materials during Drilling	
J. Jurko, A. Panda and M. Behún	145
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo	145 149
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless	
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N.	149
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta Parameters and Path Optimization on Formidability of Incremental Sheet Forming	149 153
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta  Parameters and Path Optimization on Formidability of Incremental Sheet Forming Y.C. Chen, F. Li and Q.C. Wang  Development of Continuous-Type Electric Furnace to Recover Metal Values from Waste	149 153
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta Parameters and Path Optimization on Formidability of Incremental Sheet Forming Y.C. Chen, F. Li and Q.C. Wang Development of Continuous-Type Electric Furnace to Recover Metal Values from Waste Mixed Batteries J.M. Lee, W.J. Lee and J.P. Wang Implementation of Magnetic Damping to Reduce Chatter Amplitude and Tool Wear during Turning of Stainless Steel AISI 304	149 153 161 166
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta Parameters and Path Optimization on Formidability of Incremental Sheet Forming Y.C. Chen, F. Li and Q.C. Wang Development of Continuous-Type Electric Furnace to Recover Metal Values from Waste Mixed Batteries J.M. Lee, W.J. Lee and J.P. Wang Implementation of Magnetic Damping to Reduce Chatter Amplitude and Tool Wear during	149 153 161
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta Parameters and Path Optimization on Formidability of Incremental Sheet Forming Y.C. Chen, F. Li and Q.C. Wang Development of Continuous-Type Electric Furnace to Recover Metal Values from Waste Mixed Batteries J.M. Lee, W.J. Lee and J.P. Wang Implementation of Magnetic Damping to Reduce Chatter Amplitude and Tool Wear during Turning of Stainless Steel AISI 304 A.K.M. Nurul Amin, U.A.K. Mohamad and M.D. Arif Numerical Analysis of the Galloping Character of Fan-Shaped Ice Cover Conductor Z.H. Cheng, Y.H. Chen and R.Y. Zhang Mixing Homogeneity and Rheological Characterization for Optimal Binder Formulation for Metal Injection Moulding	149 153 161 166 171 176
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta Parameters and Path Optimization on Formidability of Incremental Sheet Forming Y.C. Chen, F. Li and Q.C. Wang Development of Continuous-Type Electric Furnace to Recover Metal Values from Waste Mixed Batteries J.M. Lee, W.J. Lee and J.P. Wang Implementation of Magnetic Damping to Reduce Chatter Amplitude and Tool Wear during Turning of Stainless Steel AISI 304 A.K.M. Nurul Amin, U.A.K. Mohamad and M.D. Arif Numerical Analysis of the Galloping Character of Fan-Shaped Ice Cover Conductor Z.H. Cheng, Y.H. Chen and R.Y. Zhang Mixing Homogeneity and Rheological Characterization for Optimal Binder Formulation for Metal Injection Moulding A.M. Amin, M.H.I. Ibrahim and R. Asmawi	149 153 161 166 171
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta Parameters and Path Optimization on Formidability of Incremental Sheet Forming Y.C. Chen, F. Li and Q.C. Wang Development of Continuous-Type Electric Furnace to Recover Metal Values from Waste Mixed Batteries J.M. Lee, W.J. Lee and J.P. Wang Implementation of Magnetic Damping to Reduce Chatter Amplitude and Tool Wear during Turning of Stainless Steel AISI 304 A.K.M. Nurul Amin, U.A.K. Mohamad and M.D. Arif Numerical Analysis of the Galloping Character of Fan-Shaped Ice Cover Conductor Z.H. Cheng, Y.H. Chen and R.Y. Zhang Mixing Homogeneity and Rheological Characterization for Optimal Binder Formulation for Metal Injection Moulding	149 153 161 166 171 176
Study Accompanying Phenomenas at the Cutting Zone during Drilling Austenitic Stainless Steel X02Cr20Ni8TiMo J. Jurko, A. Panda and M. Behún Improving Rate of Penetration for PDC Drill Bit Using Reverse Engineering A.M. Abdul-Rani, M.Z. Ismail, M.A. Zaky, M.H.M. Noor, Y.Y. Zhun, K. Ganesan, T.V.V.L.N. Rao, S. Kamal and T.L. Ginta Parameters and Path Optimization on Formidability of Incremental Sheet Forming Y.C. Chen, F. Li and Q.C. Wang Development of Continuous-Type Electric Furnace to Recover Metal Values from Waste Mixed Batteries J.M. Lee, W.J. Lee and J.P. Wang Implementation of Magnetic Damping to Reduce Chatter Amplitude and Tool Wear during Turning of Stainless Steel AISI 304 A.K.M. Nurul Amin, U.A.K. Mohamad and M.D. Arif Numerical Analysis of the Galloping Character of Fan-Shaped Ice Cover Conductor Z.H. Cheng, Y.H. Chen and R.Y. Zhang Mixing Homogeneity and Rheological Characterization for Optimal Binder Formulation for Metal Injection Moulding A.M. Amin, M.H.I. Ibrahim and R. Asmawi Experimental Study of Injection Conditions for a Thin-Walled Wax Pattern Using Response Surface Methodology	149 153 161 166 171 176

Development of Batch-Type Electric Furnace for Recovery of Valuable Materials from Spent Batteries	
S.M. Shin, D.W. Lee, J.Y. Yun, B.H. Jung and J.P. Wang	197
Chapter 3: Applied Mechanics and Mechanical Engineering: Experiment, Design and Simulation	
Modeling Platform for a Micro-CHP System with SOFC Operating under Load Changes J. Kupecki	205
Elastodynamic Analysis on a Long-Distance Transmission Roller Chain J.T. Zhao, S.Z. Wang and X. Yang	209
Research Prevention of Reeling Cocoon Sinking for Automatic Silk Reeling Machine C.Z. Zhao, Q.H. Chen and W.B. Jiang	213
Experiment Study on Achieving Triangle Spraying for Complete Fluidic Sprinkler J.P. Liu, J.Y. Jiang and X.F. Liu	218
Operational Features of Motorized Spindles with HSK Tool Connection V.V. Molodtsov and A.Y. Barbin	222
Reasonable Choice of Motorized Spindles with HSK Tool Connection V.V. Molodtsov and A.Y. Barbin	229
Truck Crane Hoisting Boom Reliability Analysis Based on Probabilistic and Interval Hybrid Model and Bayesian Network	
Q. Sun, Z.Y. Xie and F.Z. Qu	235
Kinematics Simulation Research on Bionic Manipulator K. Zhao, L.M. Song, C.G. Wang, W.Q. Li and D.J. Cao	242
Design of Galvanometer Laser Scanning System Based on FPGA Q.Y. Lv and Y. Sun	246
<b>Topology Optimization of Upper Turntable of General Vertical Rocket Rivet Fixture</b> Y.H. Zhang, C. Sun and W.T. Gu	250
Application of Simulation Technology on the Design of One Special Expandable Tubular Thread	
Y.G. Liu, Z.H. Lian, X.J. Li and D.P. Ye	257
Research on Coupled Thermo-Hydro-Mechanical Mechanism for Heavy Oil Thermal Recovery F. Sun and W.D. Yang	264
Simulation Analysis of Portal Crane Braking Effect with Dual-Stage Brakes under Fluctuating Wind Load	
G.W. Qing, H. Jin and J.B. Hu	268
Study on Gas-Liquid-Solid Three-Phase Flow Field of Radial-Straight-Vane Wet Fan H.M. Zhao, M. Li, Y.Q. Ji and X. Xie	273
The Design and Research of Connecting Rod Teaching Machine Based on the Principle of Metamorphic Mechanism	
S.Y. Zeng, S. Zhou, Z. Yue, C. Yu and B. Xu	278
Flexible Modeling and Dynamic Design of the Auto Jack H.F. Qiu, S.H. Li and S.L. Wu	282
<b>Loading Capacity Calculated and Finite Element Analysis for Trough Roller</b> H.F. Qiu, S.L. Wu and H.C. Yang	286
Numerical Simulation and Analysis of Internal Flow Field for Control Valve Inlet Blocking Fault	
Y.T. An, R.J. Ma and D. Zhao	290
Study on Flow Characteristics of Valve Inlet Blockage Y.T. An, R.J. Ma and D. Zhao	294
Numerical Simulation of Supersonic Subsea Compact Wet Gas Separator for Gas Transmission Pipeline	200
F.M. Hashim and M.F.A. Ahmad  Flexible Laparoscopic Forceps Manipulator Using Synchronous Belt Mechanism	298
S.P. Chen, Y.X. Li, G.B. Li and J.L. Wang	303

Movement Mechanism Analysis of a Piezoelectric Spherical Two-Dimensional Stabilized Platform	
Q.Y. Lv, X.J. Tao, Y.S. Mei, Y. Sun and D.D. Zhang	307
Inlet Passage's Development and Optimization of New Tidal Unit-Shaft Tubular Turbine C.X. Yang, M.T. Lu, Y. Zheng, X.Q. Tian and Y.Q. Zhang	312
Improvement of Automated Guided Vehicle Design Using Finite Element Analysis S. Ahmad, C.F. Yeong, E.L.M. Su and S.H. Tang	317
Research about Dynamic Performance Prediction for Layout Structure of Globoidal Cam Machine	
Y.Y. Yao, L.P. Zhao, G.Z. Diao, H. Zhao and P. Yan	321
<b>Study on Virtual Prototype Modeling of Swing Movable Teeth Transmission</b> Y.F. Wang and Q.P. Zhang	325
Comparison of Theoretical and Numerical Analysis of Shell and Tube Heat Exchanger R.W. Jeon, B.S. Sin, K.S.P. Praveen, S.P. Kim and K.H. Lee	329
An Approach to Recognize Machining Features for In-Process Models by Using a Hybrid Graph and Rule-Based Method L. Shao, X.L. Bai, S.S. Zhang and L. Li	333
Analysis of Casing Hanger Fluid Channel Performance C. Hou, K. Zhang, H.Y. Wang, S.B. Tian, W.S. Xiao and J. Liu	338
The Determination of the Three-Point Support Design of Machine Tool Based on iSIGHT S.H. Zhao, X.C. Zhu and D.W. Zhang	342
Finite Element Analysis of the Rubber of the Prosthetic Knee Joint Y. Liu, X.F. Zhang and Y. Ma	346
<b>Design of 80000N·m Torsion Testing Machine</b> W.L. Yu	350
<b>Study on Whole PID Control Method of 5 Degree of Freedom Bearing-Less Motor</b> J.Y. Yang and Y.J. Ge	354
Design on Structural Test and Modeling of the Mounting Structure of a GTF Aircraft Engine Y. Hao and Z. Tao	358
Simulation Analysis of Thinning Spinning Instability of Tube with Extra Thin-Wall and Height Diameter/Thickness Ratio	330
Y.Z. Luo, X.H. Li, X. Zhang and B.F. Luo	362
A Novel Solar Concentrating Dish for Reduced Manufacturing Cost M. Cameron and N.A. Ahmed	368
Numerical Investigation on Supercavitating Phenomenon for the Variable-Lateral-Force Cavitator X. Hu and Y. Gao	376
Unsteady Flow Simulation of Directional Control Valve in Electro-Hydraulic Systems by Numerical Analysis	370
A. Junchangpood	382
Inherent Characteristic Similarity Analysis on Short Thin-Walled Cylindrical Shell Q.B. Han, J. Guo, N. Sun and Z. Luo	386
CFD Analysis of Energy Loss of Direction Control Valve in Electro-Hydraulic Systems with Inverter	202
A. Junchangpood  Optimal Locomotive Control Parameters of Biologically Inspired Four-Legged Walking	393
Machine S.H. Park and D.P. Hong	397
Modal Analysis and Experimental Research of Marine Gearbox W. Liu, T.J. Lin and Q.C. Peng	405
Synthetic Design of High Aspect Ratio Folding Wings Based on Aeroelastic Analysis S.L. Lv, C. Wang, Y.B. Ou, G.J. Yang and X.Y. Tong	409
Real-Time Semi-Physical Simulation of Industry Design System Based on Virtual Reality	
Technology J. Liu, L.X. Zhang and B. Cui	413
Mixing Analysis of Laminar Flow in Static Mixers with Circle Grid Fractal Perforated Plate Elements  B. Manchoor, I. Zaman, A. Sanit and A. Khalid	417
B Manchoot I Jaman A Sanitand A Khalid	/11/

Research on the Static and Dynamic Characteristics of the Sliding Rail Joint Surfaces of the Fe-Based Porous Oily Material J.F. Ma, Q. Li, L.S. Wu and C.N. Qu	422
The Thermal Structure Coupling Analysis of Hydrostatic Motorized Spindle in Ultra- Precision Grinding Machine	122
Y. Cui, H.L. Li, H.T. Huang and X.W. Xin	427
<b>Dynamic Control of Braking-Force Distribution as Turning Braking</b> D.S. Xia, Y. Yu and H. He	431
The Design of Dynamic Model of Engineering Material Arresting System N. Liu and H.B. Yu	435
Slip Enhancement in Continuously Variable Transmission (CVT) by Using Adaptive Fuzzy Logic and LQR Controller B. Sameh, S.Y. Ma and S. Samo	440
The Application of Safety Membranes in Hydropower Plant S. Chen, J. Zhang and X.D. Yu	449
Screw Fixing Fracture and Fatigue Failure on Particleboard Surface Using Different Style of Screw Insertion Technique F. Abu and M. Ahmad	454
Research on the Ride Comfort of Electric Drive System Based on Double Trailing Arm Suspension	
W. Wang, Y. Li, S. Zhang and B. Wang  Double-Acting Pneumatic-Hydraulic Pressure Amplifier Having Two-Step Liquid Pressure Output Pressure Driven by Pneumatic Cylinder with Rodless Piston	458
M.D. Wang, L.N. Sun and K.M. Zhong  Influence of Tailrace Surge Chamber with Standpipe on Draft Tube Pressure S. Chen, J. Zhang and J.F. An	467 472
Research on Marine Electric Propulsion Shafting under Electromechanical Coupling Condition	477
N.Q. Xiao, R.P. Zhou and X.C. Lin  A Design of Mini Actuator for Compact Camera without Using Permanent Magnet C.L. Tsai and D.C. Liaw	477 483
Influence Characteristics of Shaft and Disk Models on Natural Frequency of Single-Rotor System	
X.C. Lin, R.P. Zhou and N.Q. Xiao	490
Study on Hydraulic System for Full Hybrid Transmission Y. Han	495
Performance and Loads Investigation of Optimum Speed Rotors S.M. Liu, W.D. Yang, L.H. Dong and J. Wu	500
Optimal Design of Voice Coil Motor for Micro Stage J.H. Jeong, M.H. Kim, S.W. Woo, D.G. Gweon and D.P. Hong	507
Development of Vibration Simulator to Evaluate Vibration Characteristics for Railway Structure H.J. Yoon	511
The Analyses of the Critical Speed and Unbalance Response in the Rotor System J.L. Liu, Z.R. Hao, J. Xu and Q.M. Meng	515
The Vibration Radiation Noise and Optimized Analysis of the Shell Q.M. Meng, Z.R. Hao, J. Xu and J.L. Liu	519
Vibration Test of Bearing Ball Fatigue Testing Machine Based on VB S.Q. Wu, M. Mei, J.L. Zhou, W.N. Zhu and G.Q. Wu	523
Gear Meshing Noise of the Closed Gearbox F.Z. Chen, Y.J. Shi and L.Y. Yu	527
Study of Improving Low Voltage Ride - Through Capability of Doubly - Fed Induction Generator by Using DVR C. Jian, R.Y. Feng and H.H. Bin	531
Design and Manufacture of the Prototype of an Innovative Pump for 'Proof of Concept' Test	
N.A. Ahmed and T.R. Day	536

641

Research on DEH System Characteristics Effect on Power System Low-Frequency Oscillations F.P. Pan, S.C. Liu, Y.Q. Zhu, Z.Q. Pang, L.L. Shi and J. Li	542
Unsaturated Polyesters as Stamps for Hot Embossing of Micropumps Y.C. Hsu, P.Y. Cheng, H.W. Lee and S.F. Su	547
Influence of Successive Load Rejections on Water Hammer Pressure of Spiral Case in Long Diversion-Type Hydropower Station X.D. Yu, J. Zhang and C.Y. Fan	551
Research of the Impact of Turbine Parameters on Low-Frequency Oscillation Based on Simulink	556
Y.Q. Zhu, M. Zhong, F.P. Pan, J. Luo, X. Zhang and W.J. Huang  Valveless Pump in Closed Loop Tube System  M.M. Mahat, I. Tharazi, L. Roslan and M.F. Jasni	556 561
Numerical Simulation of In-Pipe Turbulent Noise J. Xu, Z.R. Hao and Z.H. Zhou	565
The Optimization Model of in Job-Shop Scheduling Problem with Alternative Machines Based on Improved Genetic Algorithm Q. Chi, X.L. Fu, Y.N. Pan and Z.H. An	569
Finite Element Analysis and Topology Optimization Design for Motional Board of Injection Molding Machine	
E.G. Zhang, L. Wang and W.J. Shan  Research to the Overall Design of 4-Axis VMC Based on CAD and NC Mfg Verification  W. Zhun	573 577
Computer Aided Design and Manufacture of a Novel Vertical Axis Wind Turbine Rotor with Winglet N.A. Ahmed and K.J. Netto	581
Engine Performance and Emission of Emulsified Biodiesel A. Aziz, A.F. Yusof, R. Mamat and W.N. Azeem	588
Analysis on Dynamic Characteristics of Closed Hydrostatic Guideway Throttled by Capillary	
X.C. Zhu, W.G. Gao, T. Liu, S.H. Zhao, G.W. Zhang and D.W. Zhang  Analysis of the Dynamic Characteristics of the Aerostatic Journal Bearings	594
C.D. Xu, H.H. Feng and F.F. Wang  Vehicle Braking Stability Analysis in Turn Condition  L. Zhao	600
Combined Influence of Misalignment and Orifice Diameter on the Static Performances of Hydrostatic, Water-Lubricated Journal Bearings H.H. Feng, C.D. Xu and F.F. Wang	608
Simulation on the Life Expectancy of Fine Blanking Tool Punch for High-Strength Automobile Start Motor Flange	008
J.D. Kim and H.J. Ko  The Design of Electromagnetic Preheating Unit for Vehicle Engines	612
J. Yan, S.T. Cui and F. Zhang  Effect of Biodiesel from Waste Cooking Oil on Mixture Formation and Emission of Burner	616
Combustion A. Khalid, L. Lambosi, M.M. Lokman, B. Manshoor, I. Zaman, A. Sapit and S.H. Amirnordin	620
Study on 3D Model Reconstruction of Vehicles from 2D Images H.S. Zhang, G.B. Gao and B. Li	625
The Study on PCCI Mode of Diesel Engine Fueled with Methanol/Dimethyl Ether Y. Yan and Y.S. Zhang	629
Research on the Fault Characteristic Extraction of Hydropower Units Based on Hilbert- Huang Transform	(22
Y.Q. Zhang, Y.T. Zhu, Y. Zheng, Y. Feng, X.F. Ge and X.Q. Tian	633
Chapter 4: Testing, Detection and Monitoring Technologies	

 $\begin{array}{l} \textbf{A Rapid and Efficient Feature Point Detection and Matching Algorithm} \\ X.L.\ Ding,\ Q.\ Zhao,\ Y.B.\ Li\ and\ X.\ Ma \end{array}$ 

The Design of Online Measurement System for Polyurethane Sheet W. Liu, L.L. Wang and C.J. Du	647
Review on Visibility Monitoring in Expressway under Foggy Condition L.B. Zhu, J. Wang, X. Huang, H. Wang and P. Liu	651
A Comparison of Short Duration Traffic Counts Methodologies for Estimating Annual Average Daily Traffic J.A. Ha	657
Eye Movements as a Means to Evaluate Operation Interface of Flat Knitting Machine Z.H. Liu, S.Z. Wang, Q. Shen and J.J. Feng	664
Comparison of Crack Extraction Performance According to Different Edge Detectors H.W. Cho and H.J. Yoon	669
The Design of Data Acquisition System in Wireless Dynamic Strain Acquisition Technology C. Ding, Y.W. Dai, P. Li, Y. Sun, W.Z. Wang and J.W. Shen	673
Whole-Condition Dynamic Alarm Research of Hydropower Unit Operating Parameters X.F. Ge, Y. Feng, Y.Z. Liu, Y.Q. Zhang and Y. Zheng	677
Energy Saving Algorithm Research Based on Interior Monitoring System Z. Kai, Y.C. Liang and X. Qiao	681
<b>Building a Practical Anechoic Chamber for Aero-Acoustic Measurements</b> R.F. Ahmed, Y. Yendrew and N.A. Ahmed	685
Manufacture and Material Considerations in Wind Tunnel Experimentation H. Yu, N.A. Ahmed and T.G. Flynn	694
Effects of UV-HEPA Air Filters on Air Quality Status inside a Public Museum in Malaysia M. Ismail, N.H.A. Baharuddin, A.S. Anuar and A. Suroto	700
Changes Process of the Shear Modulus in Gravel Bed under Horizontal Vibration Triggering	<b>=</b> 00
H.Y. Jiang, L.L. Song and J.B. Lu  Finite Element Analysis of Gold Bonding under Different Loading Conditions	709
W.L. Tang, C.Y. Huang, T.M. Li, Y. Liang, G.J. Xiong, S. Wu, C.Q. Li and Z.P. Ning  Safety Margin Characterization for In-Service Pressure Vessels Containing Crack Defects	713
S.J. Lin, W. Long and D.Q. Tian  Module Similarity Measure Method of Products Based on Assembly Relationship	717
Y.H. Chen, D.J. Zhou and Z.H. Wu Power Spectrum Analysis Based on VB Language	721
J.L. Zhou, S.Q. Wu, G.Q. Wu, C.S. Zhai, M. Mei, S.Y. Yang, Z.M. Chen and P.P. Lu  Analysis of Laminated Composite Plates by Local Inverse Multiquadrics Collocation	727
Method S. Xiang	731
Seismic Response Analysis of Large-Scale Site with Circular Diaphragm Wall R.L. Zhang, W.D. Yang and F. Sun	735
Fault Diagnosis for CNC Machine Tool Based on Mapping Model B. Sheng, C. Deng, Y. Xiong, Z.J. Luo and Y.H. Wang	739
A Study on the Interference Checking in CNC Incremental Forming Based on Parasolid H. Zhu, X.Y. Jing, B.C. Lv and J. Ju	743
A Study on Contact Angle and Surface Tension on Copper-ABS for FDM Feedstock N. Sa'ude, N.M.A. Isa, M. Ibrahim and M.H.I. Ibrahim	747
Chapter 5: Robotics, Control System and Applications	
A Case Study of the Link between Virtual and Physical Prototyping in Servo-Pneumatic System	
P. Pratumsuwan, P. Nunthavarawong and A. Junchangpood	755
A Novel 3-DOF Parallel Robot and its Kinematic Analysis X.B. Liu, X.D. Yuan, X.F. Wei and W. Ni	759
The Research of Kinematic Model in the Rehabilitative Training System Q. Wang and R. Ji	764

Research on Compiled-Type Numerical Control System and its Data Compression Technology	
K.Y. Wang, Y.X. Yao and L. Zhou	768
Comparison between Waveform and Bug Path Planning Algorithm for Mobile Robot S.H. Tang, C.F. Yeong and E.L.M. Su	774
Comparison between Normal Waveform and Modified Wavefront Path Planning Algorithm for Mobile Robot	770
S.H. Tang, C.F. Yeong and E.L.M. Su	778
Development of Automatic Wafer Centering System for Vacuum Transfer Robot Using for Semiconductor Manufacturing M.J. Chung and S.J. Lee	782
Molecular Sieve Valve Control System Based on DCS Q. Yin, T. Sun and T.T. Meng	786
Low Cost Sensor Data Fusion in Omnidirectional Mobile Robot Feedback System to Improve the Navigation Accuracy W.K. Tey, C.F. Yeong, Y.L. Seow, E.L.M. Su and S.H. Tang	791
Electro-Hydraulic Servo Actuator Fuzzy Self-Tuning PID Control Research X.G. Wang, L. Li, X.L. Wei, G.Q. Chen and B.F. Liu	795
<b>Position Tracking Control of Flexible Robot Joints Using Model Predictive Control</b> N.Z. Wei, H.X. Sun, Q.X. Jia and P. Ye	799
Probabilistic Approach to Mobile Robot Localization Based on Gaussian Models of Sensors F. Duchoň, A. Babinec, J. Rodina, T. Fico and P. Hubinský	803
Electro-Hydraulic Servo Actuator Parameters Self-Tuning Three-Dimensional Fuzzy	
Control Research X.G. Wang, L. Li, H.L. Han, X.L. Wei, M.D. An and B.F. Liu	811
Chapter 6: Product Design, Computation and Information Technologies	
The Estimation of Reliability Function in Terms of the Catastrophe Theory A. Pitukhin and I. Skobtsov	817
Research and Motion Analysis of Multi-Object Compact Layout Based on CPR in 2D Y.J. Zheng, F.Y. Long, J.Y. Ma, W. Xia, B. Chen and X.P. Liao	821
The Design and Implementation of PDM System for Small and Medium Enterprises H. Lin	826
The Computation of the Effective Temperature of the Land Surface Covered with Canopy H.Z. Ma and S.M. Liu	830
Variable Parameters-Based Damage Creep Model of Weak Rock Layer and its Engineering Application  W.D. Vang, J.D. Chen, F. Sun and V.M. Zhang.	835
W.D. Yang, J.P. Chen, F. Sun and Y.M. Zhang <b>Summary of and Lessons from Domestic and Overseas Setting of Truck Escape Ramp</b> K.M. Wu, D.Z. Hou, L.D. Zhong, C.C. Li and J.J. Tang	839
Research on Active Absorbing Wave Maker System Y.Q. Zhang and L.F. Yu	847
A New Contour-Parallel Tool Path Planning Algorithm for 2D Pockets M. Liu, Y.X. Yao and L. Zhou	853
Speeding Maintenance Performance through Time Study N. Harudin and S.M. Yusof	860
Ontologies to Capture and Share Knowledge in a Distributed Environment Needed to Support Decision Making in Probabilistic Design	0.64
K.J. Lee and J.H. Choi  Dynamic Clustering Heuristic Method for Smart Grid Computing	864
J.S. Kim and J.H. Kim  Performance Analysis of the PISO-Based CFD Simulation	868
X.G. Ren	872
Research of Hadoop Task Speculative Execution Based on Process Migration Y.C. Liang, Z. Kai and C. Du	877
Review of Analysis Model on Three-Dimensional Braided Composites H.Y. Chen, G.F. Wei and Y. Xu	881

The Fuzzy Evaluation Based on Entropy Method for Heavy Oil Reservoir Horizontal Well	
CO <sub>2</sub> Huff and Puff Well Selection	
Y.H. Li and C.Z. Peng	886
Numerical Analysis of the Iced Transmission Line Galloping L. Qin and T.Y. Xu	894
Double Erasures Correcting MDS Code with Heterogeneous Placement X. Luo and H. Shen	901
Based on the Analysis and Study of Computer-Aided Industrial Design (CAID) Technology K. Hui and J. Li	906
Comparison Study of Multi-Layer and Folding Liners of Corrugated Cartons - Domestic Ceramic Packaging Y.Z. Xiao and X.H. Hao	909
Application of New Design Method by High-Strength Composite Material H. Iida, T. Fujishima, Y. Ohbuchi and H. Sakamoto	915
The Development of Bicycle into Trandem: The Bike Can Be Used as Tandem or Single Depend of the Necessity  B. Iskandriawan and Jatmiko	920
Intelligent Quilt Based on Conductive Textile Materials, Smart Flexible Sensors, and Composite Charging Technology	926
J.L. Li and L.P. Zhu	9/0