Advanced Mechanical Engineering III

Selected, peer reviewed papers from the 2013 International Conference on Advanced Mechanical Engineering (AME 2013)

Applied Mechanics and Materials Volume 288

Wuhan, China
2 – 3 February 2013

Editors:

Zhenyu Du
Bin Liu

ISBN: 978-1-62748-056-7
ISSN: 1660-9336
Table of Contents

Preface, Sponsors and Committees

Chapter 1: Advanced Mechanical Engineering and Novel Devices

Topology and Size Optimization for Landslide Body in NC Lathe
Z.S. Sai, G.F. Wang and M. Cong

Simulation of Engine Block Drilling
H. Zhang, J. Song and M. Cong

Design of Offsetting Steerable Mechanism for Rotary Steerable Drilling Tool Based on Double Eccentric Rings
Z.D. Yan, Y.F. Geng, Z.F. Wang and W.L. Wang

Calibration and Optimization for Spindle-Tilting Type Five-Axis Machine Tools with Inclinable Head AB Based on Compensation of Rotation Axis Direction Error

Study on Recognize for Lamb Wave Test Signals Based on Finite Element Modeling
Y. Liu, Y.M. Wang, C.J. Shen and F.R. Sun

Efficiency Modeling and Experimental Verification of Minicar Transmission System
W.P. Wang

Discrete Element Method for Mechanics Properties and Size Effect Analysis of Granite
Y. Ye and L. Kang

The Drag Reduction Mechanism of Vibration Digging Shovel
W.Y. Ning, Y. Chen, Y.L. Kuang and Y.H. Zhang

A Improved Design of Mechanical Structure of a Coin-Wrapping Machine Based on Pro/E Software
X.D. Jing, D. Wei and S. Kang

Contact Finite Element Analysis of Spindle-Toolholder Joint
X.L. Song, L.G. Cai and Y.S. Zhao

Design of Shear Stress Detection Device for Corn Stubble
D.W. Guo, X.W. Bai and Y.K. Li

Study on Structural Performance of the Cylindrical Pressure Hull for Underwater Vehicles
Z.Y. Mao, C. Wei, Y. Fan and W.C. Huang

Failure Modes Mechanisms Effects Analysis for Refrigeration Device
R.X. Xu and Y. Liu

Dynamic Analysis of Electric Spindle Based on ANSYS
L.L. Zhang and X.Y. Qin

Study of Factors with Effects on Tracked Vehicle Driving Resistance Basis of Bekker Theory
C.B. Yang, L. Gu and W.W. Lv

Design of Hydraulic System for Electrohydraulic Servo Valve Test Bed
D.H. Su and X.D. Tang

Study on Collaborative Simulation Interfaces Applied in Caterpillar
J.C. Zhu and S. Zhu

Contact Strength of Toroidal Drive with Cylindrical Teeth
S.P. Yang, Y.Q. Tan, Y.L. Pan, L.M. Li and J.G. Liu

The Influences of the Volume in Asphalt Foam Device on Foaming Asphalt Characteristics in Cold Foam Asphalt Recycling Equipment
K. Li and S.J. Jiao

Chapter 2: Advanced Mechatronic, Automation, Sensor, Control and Hybrid Electric Vehicles Applications

Stability of Neutral Stochastic Delay Differential Equations with Infinite Delay
R. Hu and D.J. Shao
A Research on Detection and Identification of Harmful Gas Utilizing Cataluminescence-Based Sensor Array
L.S. Zhou 109

Omni-Directional Vision System for Mobile Robot Using Structured Lights
Y. Zhang, Y. Li and Q.L. Wang 114

An Automobile Exhaust Sensor Utilizing Cataluminescence on Nanosized Fe$_3$O$_4$/SiO$_2$
L.S. Zhou 121

Overview Study of Multi-Dynamic Coupling Drive System on EV
X.H. Wu and W. Li 125

Coordinated Motion Control and Auto-Grasp Planning of AUVMS Based Multi-Sensors Fusion
K. Yu, S. Liu and Z.C. Deng 130

Electrically Controlled Air Suspension Bus Control System Design
F. Wang 137

Powertrain Matching Based on Driving Cycle for Fuel Cell Hybrid Electric Vehicle

Design of Energy Saving System for Hybrid Power Loader
Q.H. Lv and X.Y. Xiao 148

The Research of Height Control Strategy of the Electrically Controlled Air Suspension
J.R. Nan, Z. Chai and J.K. Huang 156

An Automatic Aeroponics Growth System Based on Ultrasonic Atomization
J. Liu and Y.W. Zhang 161

Monitoring and Control System of Variable Frequency Aeration Based on PID Control
J. Huan, X.Q. Liu, H.Y. Wang and H.Y. Wang 167

New Highway Power Generation Device Based on Auto Wake
J.B. Xiao, W.G. Zheng and Y. Su 172

Study on Powertrain Matching Based on Driving Cycle for Hybrid Electric Vehicle

Research on Construction Machinery Products’ Color Imagery Based on Genetic Algorithm
C. Yao, Q.S. Xie and W. Zheng 183

Research on Electromagnetic Actuator of Small Anti-Submarine Weapon
J. Xiong 188

Review of Methods of Mechanical Digital Design Based on Topology Optimization
X.Y. Wang, H. Zhao, Z.F. Zhang and Y. Wang 193

Research of Double Internal Model Control for High Speed Spindle
J. Meng, Z.Z. Lei and Z.L. Li 202

Geometric Modeling of Spiral Bevel Gear under Virtual Reality
J.H. Wang, P.L. Yin, Q.C. Lao and Y. Huang 208

Tea Flushes Identification Based on Machine Vision for High-Quality Tea at Harvest
X.J. Jin, Y. Chen, Y.Q. Guo, Y.X. Sun and J. Chen 214

The Simulation Analysis of Control Performance on Closed-Loop Control the Digital Hydraulic Cylinder
D.H. Su, X. Li and Y.L. Wang 219

Design and Implementation of Engine Waveform Tester Based on Virtual Instrument
J.G. Ma, H.Y. Song and J.L. Hou 223

Automatic Analysis on Parametric of Truck Crane Boom Based on APDL and VB
Y. Fei, Y.J. Liu and Y.Y. Li 228

The Simulation Analysis of the Efficiency about Truck Crane Lifting Load Sensing Hydraulic Loop
Y. Fei, B. Bian and Y.Y. Li 233

Chapter 3: Advanced Manufacturing Processes and Applications

Adaptive Slicing Algorithm Based on STL Model
X.D. Pan, K. Chen, Z.Y. Zhang, D.F. Chen and T.T. Li 241

Modeling of the Hot-Pressing Process in the Production of Particleboard
X.J. Wang, H.P. Li and J. Cao 246
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Uncertain Programming Model for Manufacturing/Remanufacturing Hybrid System in Reverse Logistics Environment</td>
<td>Y.J. Chen and D.B. Liu</td>
<td>251</td>
</tr>
<tr>
<td>The Optimal Stretching Angle of Honeycomb Paper Core Based on the Fourth Strength Principle</td>
<td>J. Wu, Y.L. Wang, Y. Zhang, G.M. Zhang and Y.P. Du</td>
<td>256</td>
</tr>
<tr>
<td>Research on Influencing Factors of Enhancing Independent Innovation Ability for Scientific and Technological Enterprises</td>
<td>X.D. Li, L.K. Shi, B.J. Yang, S. Wang and W. Hong</td>
<td>262</td>
</tr>
<tr>
<td>Study on Load of Hollow Motor Shaft by 4-Roll Cross Wedge Rolling</td>
<td>Y.M. Yang, F.W. Cheng, J.C. Chen and J. Zhao</td>
<td>267</td>
</tr>
<tr>
<td>Research on the Model of Water Jet Propulsion Using Compressed Gas Based on Fluent Software</td>
<td>X.G. Zhou and J.H. Han</td>
<td>276</td>
</tr>
<tr>
<td>Finite Element Analysis of the Extruder Die Axis Based on ANSYS</td>
<td>S.J. Hu, H.X. Zhang and D.L. Zhang</td>
<td>282</td>
</tr>
<tr>
<td>Experimental Study on Cooling-Air Grinding of High Speed Steel</td>
<td>Q.C. Lao and Z.Y. Shang</td>
<td>308</td>
</tr>
<tr>
<td>Application of TRIZ Methodology in Solving Technology Conflicts of Rapid Folding Bicycle</td>
<td>Q. Sun, Q.S. Xie and Z. Li</td>
<td>313</td>
</tr>
<tr>
<td>Manufacturing and Microstructure of Cu Coated Diamonds/SnAgCu Composite Solder Bumps</td>
<td>Y. Zhong, W. Zhang, C.Q. Wang and B. Li</td>
<td>323</td>
</tr>
<tr>
<td>Innovative Application Research on CNC Machining Technology in Mould</td>
<td>Y. Li, J.J. Qi and Y. Nan</td>
<td>328</td>
</tr>
</tbody>
</table>