# Table of Contents

**Preface, Committees and Sponsors**

**Chapter 1: Research and Designing in Mechanical Engineering**

| Study on Special Vehicle's Handling Stability by Test Technology | Y. Zhao, H.J. Cheng, Y. Liu and Z.J. Wu | 3 |
| Material Study of a Short Seismic Link in a Dissipative Structure of a Vertical Industrial Boiler | J. Protivinský and M. Krejsa | 10 |
| Numerical Analysis of the E-Type Diaphragm Based on ANSYS | L.N. Song, J. Shao, D.Q. Feng and W. Fan | 34 |
| Modal Analysis for the Fuselage of the New Tube Automatically Benchmarked Equipment Based on ANSYS Workbench | F.Y. Chen, Y. Wu and Y.A. He | 41 |
| Characteristics Analysis of Tire Hydroplaning Flow and Tread Design Influence Study | J. Yang, G.L. Wang and H.C. Zhou | 57 |
| Study on Finite Element Analysis of the Rolled-Steel Pallet Based on Ansys | Z. Fang, M. Han and Y.Y. Li | 66 |
| Numerical Simulation of Water Impact of 2D Wedge with Different Density | C.J. Li, H.L. Ren and C.F. Li | 73 |
| Polynomial Stability for Timoshenko-Type System with Past History | Z.Y. Ma | 78 |
| Failure Mode Analysis for High-Speed Motorized Spindle of NC Machine Tools | Y.A. He and Y.M. He | 85 |
| A Finite Element Method to Simulate Ice Based on Multi-Surface Failure Criterion | C. Wang, H.L. Ren and H. Li | 90 |
| Asymptotically Self-Similar Solution for the Convection-Diffusion Equation | X. Yu and Q.S. Zhang | 97 |

**Chapter 2: Materials and Processing Technologies in Mechanical Engineering**

| Electroless Nickel-Phosphor-Boron Plating and Electroplate Nickel on Surface of Optical Fiber | J. Peng | 103 |
| The Design of NC Spherical Turning and Grinding Machine Tool | Y.Q. Wang and X.Z. Li | 108 |
| Deformation Characteristic Analysis on Air Bending in JCO Forming of Large Diameter Welding Pipe | L.F. Fan, Y. Gao, J.X. Yan and J.B. Yun | 113 |
| Effects of Simulation Parameters on Springback in Air Bending of JCO Forming | L.F. Fan, Y. Gao, J.X. Yan and J.B. Yun | 117 |
| Finite Element Technique for Predicting Stress Distribution in Milling TC4 Titanium Alloy | B. Li and S.L. Zhao | 121 |
Deformation Characteristic Analysis on Mechanical Expanding of Large Diameter Welding Pipe
L.F. Fan, Y. Gao, J.X. Yan and J.B. Yun 125

Effects of Mould on Crimping of Large Diameter Welding Pipe
J.X. Yan, J.B. Yun and L.F. Fan 129

Effects of Technical Parameters on Mechanical Expanding of Large Diameter Welding Pipe
J.X. Yan, J.B. Yun and L.F. Fan 133

Sensitivity Analysis of Technical Parameters on Springback in Air Bending of JCO Forming
J.X. Yan, J.B. Yun and L.F. Fan 137

Chapter 3: Processing of Signal and Data

The Research on Fault Diagnosis of Diesel Engine Based on EMD
B.L. Song 143

Research on the Bus Passenger Motion Vector Algorithm Based on Video Image
H.K. Xiang and L.Q. Cheng 149

Mean Shift-Based Target Tracking for Moving Spherical Object in Video
B.Z. Li 156

Noise-Reducing and Effect-Enhancing System for Communication Equipment Mounted on Vehicle
L. Chen, S.H. Fan and S.N. Zhang 161

An Improved Algorithm on Frequent Subgraph Query
Y.J. Chu and X. Jia 169

Chapter 4: Mechatronics, Robotics and Control

A New Design of Embedded Wireless Sensor Network
B. Wang 177

Research and Develop of Tube Catching Manipulator Control System Based on DMC
Q. Zhu, Y. Wu and Y.A. He 182

Simulation Study on Single-Phase Parallel Type of APF Double Loop Control Technique

Switch Module Designed to Meet the EPS Reliability Intelligent Control
L.G. Zhang and J. Gao 195

Fault Detection and Diagnosis for Sensor in Complex Control System Based on KPCA
P. Xu, Y.C. Wang, K. Wang and Q.Y. Wang 202

Comprehensive Example Analysis on Main Technology of Exoskeletal Robot System for Upper Limb Rehabilitation
M.S. Chen and L. Zhao 211

Comprehensive Review on Main Technology of Exoskeletal Robot System for Upper Limb Rehabilitation
L. Zhao 219

Chapter 5: Information Technologies

Design and Realization on the Financial Early-Warning Analysis System of Colleges and Universities Based on Data Mining Technology
D.J. Qi and H.Y. Hu 229

Based on the User-Centered Design and Development of Fiber Sensor Monitoring System
J.N. Li, W. Wang, Y.K. Zhen and X.Q. Liu 234

Analysis of Adaptive Learning Knowledge Model Based on Cloud Computing
W.Y. Li 241

The Construction and Practice of Private College Campus Portal System
T. Feng 245
A Design of Information Security Curriculum Based on Social Networks and Edutainment
P. Ruan and Z. Wei

Integration of Network Resources Based on Unified Identity Authentication
P.Y. Fan and Y. Qiu

“Public Relations” Course Design and Implement Based on Google Cloud
L. Yu

A Chinese Small Vocabulary Offline Speech Recognition System Based on Pocketsphinx in Android Platform
X.F. Liu and H. Zhou

Research on Decoding Scheme of S6a Interface Diameter Protocol in LTE Network Monitoring System
Y.Y. Han, B. Xi and Z.Z. Zhang

Implementation of Remote Monitoring System Based on S3C2440
W.S. Cheng, Z.H. Fu and S.X. Leng

Chapter 6: Engineering Management

The Urban Competitiveness Analysis and Research of Urbanization of Hebei Province
Z. Hao

Study on the Impacts of Salinized Soils on the Quality of Upper Water during Seawater Intrusion
Y.M. Che, H.X. Hu and X.Q. Wan

The Analysis and Research of Northeast Route Network Optimization
W.W. Song and C. Huang

Based on Grey Correlation Theory of the Eastern Region Industrial Economic Efficiency Evaluation and Analysis
R.P. Li, W. Gao and Y.J. Li

The Impact of Free Cash Flow and Capital Structure on the Performance of the Company
G.Z. Wang, Z.Y. Wang and Y.J. Li

Study on the Relationship between the Energy Carbon Emission and Economic Growth in Hebei Province
Y. Zhang and C. Wang

Developing Situation and Tendency of Tire Industries in Developed Countries
Z.J. Wang and S. Liu

Study on Cognitive Dissonance of Passive Safety Investment Based on Cultural Psychology
Y.F. Hong and H.B. Song