## **Table of Contents**

| Preface and Organizing Committee   |          |
|--|----------|
| Solving the Flexible Job Shop Scheduling Problem Based on Memetic Algorithm G.H. Zhang   | 1        |
| The Optimal Combination Research of System Configuration and T&M Policy of Standby Safety System Z.Y. Hu, L.Y. Xie and X.J. Zhang                      | 6        |
| Black Box System Multi-Objective Optimization Based on Design of Experiment T.Z. Sui, L. Wang, D.M. Cheng and H.W. Cui                                 | 12       |
| Strength and Reliability Analysis of Hydraulic Support Y.Y. Ma, L.Y. Xie and X.F. Qin  | 18       |
| <b>Equipment Performance Degradation Modeling for Reliability Prediction Based on n-ARIMA Model</b>  |          |
| J. Wu, C. Deng, H. Xiong and Y. Xiong  Research on Fault Diagnosis Based on BP-SOM Hybrid Algorithms for NC Machine                                    | 24       |
| C. Deng, W.L. Dong, Y.H. Wang and Y. Xiong  An Optimization Method of the Heavy Machine Cutting Parameters C. Deng, C. Ma, Y. Xiong and Y.H. Wang      | 32<br>38 |
| Optimization of Condition-Based Maintenance Policy for Deteriorating System Based on Monte-Carlo Simulation  | 30       |
| E.S. Ge, Q.M. Li and A.L. Huang  Variable-Fidelity Multidisciplinary Design Optimization Based on Analytical Target                                    | 44       |
| Cascading Framework J. Zheng, H.B. Qiu and X.L. Zhang  | 49       |
| Distribution of Time Between Failures of Numerical Control System Based on Censored Data Y. Dai, X.Z. Yang and N. Ji                                   | 55       |
| Research on Two Ends Energy-Absorbing Structure of High-Speed Railway Passenger Car<br>Body  | 33       |
| Z.X. Zhang, S.N. Xiao, G.W. Yang and X.M. Shang  A Study on the 6-6 Stewart Parallel Mechanism Dynamics in ADAMS                                       | 61       |
| X. Han, C. Li, X.G. Yu and G.B. Zhao  Small Sample Reliability Analysis of Automatic Ultrasonic Testing of Austenitic Steel Defect                     | 67       |
| J. Zhang, H. Ding, M. Li and G.B. Ma  Design of Current Selective Protection in Intelligent Molded Case Circuit Breaker                                | 72       |
| Y.J. Zhou, W.B. Chen and Z. Chen  Research on Profit Model of Diesel Engine Products-Services System   | 77       |
| Z.H. Liu, D.D. Song and J. Su  Wear Life Prediction for a Large Diameter Spool Valve   | 82       |
| K. Xia, S.D. Yang, T. Lei and L. Wu  Testability Design of the PHM System for Aero-Engines   | 88       |
| Z.H. Wen, Y.P. Liu and X. Yin  Design and Research of Large-Inclination Screw Conveyor Angle Changing Test   | 94       |
| Equipment S.Z. Zhou, C.X. Liu, H.Y. Jia, Z.P. Lv and Z.X. Sun  P. D. Investment on Alternative Evel Vehicles: Insights from a Two Stage Come Theoretic | 99       |
| R&D Investment on Alternative Fuel Vehicles: Insights from a Two-Stage Game Theoretic Model C.J. Chi and T.J. Ma                                       | 105      |
| Reliability Analysis for Rotor System with Oil Whip and Resonance Based on Frequency C.Q. Su and Y.M. Zhang  | 110      |
| A New Reliability Analysis Method Based on Stability Reliability for Closed-Loop Control System  |          |
| X.H. Guo, Z.X. Jiao and S.P. Wang  A Fuzzy Linguistic Go/No-Go Decision Model in New Product Development   | 115      |
| H.B. Yan and T.J. Ma   | 121      |

| On Uncertainties of Kansei in Kansei Engineering: A Fuzzy Linguistic Approach H.B. Yan and T.J. Ma   | 130 |
|--|-----|
| Strength Optimization Design of a Helical Hydraulic Rotary Actuator Y. Yang, X. Guo, S.D. Yang and T. Xu   | 139 |
| Modeling of Fatigue Crack Closure by Finite Element Method Z.Y. Ding, X.G. Wang and Z.L. Gao   | 145 |
| Study on Influencing Factors on Reliability of Permanent Magnet Synchronous Motor System in Electric Vehicle                                       | 151 |
| K.L. Yang and Q. Song  Projection Model of Intuitionistic Fuzzy Multiple Attribution Decision Making about  Preventive Maintenance Modes in RCMA   | 151 |
| J.W. Cheng, G.B. Zhang, X.G. Liu and C. Wang  Analytical Target Cascading Based on the Quadratic Exterior Penalty Method for Complex               | 159 |
| System Design X.L. Zhang, P. Jiang, J. Zheng and Y. Li   | 164 |
| The Simulation of the Ship Production Design Process Based on Hierarchical Timed Petri<br>Net  |     |
| R. Yan, P. Jiang, W.J. Li, J. Yan and L. Wen   | 170 |
| Intelligent Irrigation System Reliability Simulation S. Yu, C.L. Ao and H.G. Chen  | 176 |
| <b>Determination of the Critical Plane under the Multiaxial Complex Loading</b> L. Wang, T.Z. Sui, Y. Ma and Y. Sun                                | 182 |
| Research of the Thought and Method in Function Reserving Design Based on Individuation Degree Evaluation C.F. Li, Z.Q. Ye, Y.H. Wang and X.M. Feng | 188 |
| Optimal Design of the Large-Diameter Spinning Torispherical Head D. Zhang, S.P. Sheng and Z.L. Gao   | 194 |
| A Design Space Exploration Method Using Artificial Neural Networks and Metamodeling L. Chi, H.B. Qiu, Z.Z. Chen and L. Ke                          | 200 |
| Engineering Design Based on Hammersley Sequences Sampling Method and SVR L. Ke, H.B. Qiu, Z.Z. Chen and L. Chi                                     | 206 |
| Reliability Analysis Method Based on Support Vector Machines Classification and Adaptive   |     |
| Sampling Strategy H.Y. Hao, H.B. Qiu, Z.Z. Chen and H.D. Xiong   | 212 |
| The System of Signal Detection Based on Sensing Needle J.M. Lei, X. Zeng and X.C. Zou  | 218 |
| A Reliability Index Based Decoupling Method for Reliability-Based Design Optimization Z.Z. Chen, H.B. Qiu, H.Y. Hao and H.D. Xiong                 | 223 |
| The Multi-Objective Oriented Product Design Method in the Machine Tool W.Z. Li and X.Y. Yang   | 229 |
| The Action Mechanism of the Layering User Demands in the Product R&D Process W.Z. Li and X.Y. Yang   | 235 |
| Research on the Logistics Distribution under the Electronic Commerce Environment in Henan Province Y. Shi  | 240 |
| Using the Memetic Algorithm for Multi Objective Job Shop Scheduling Problems G.H. Zhang  | 245 |
| Method for Determining the Reliable Life Parameter of Turbine Wheel of Turbocharger with Over-Speed Failure Mode                                   |     |
| Z. Wang, A.N. Wang, K. Guo, L. Zhuang and L. Hua  Research of High Speed Train Carbody Structure Vibration Behaviors and Structure                 | 251 |
| Fatigue Strength Characteristic Technology B.R. Miao, W.H. Zhang, G.H. Huang, S.C. Wu and Y.X. Zhao  | 256 |
| Aging Properties of the Remaining Components of <i>n-k</i> +1 out of <i>n</i> Systems Z.C. Zhang and H.Z. Liu                                      | 262 |
| Prediction of Deformations of Steel Plate by GEP in Forming Process L. Yang and L. Gao   | 268 |

| Short Fatigue Crack Propagation Threshold of Railway LZ50 Axle Steel Y.X. Zhao, Z. He and B. Yang              | 274 |
|--|-----|
| Fatigue Crack Growth Law Covering Threshold and Fracture Toughness for Railway LZ50<br>Axle Steel<br>Y.X. Zhao | 280 |
| Failure Analysis on Bearings of Railway Freight Cars with Radial Bogie Y.X. Zhao and B. Zhang                  | 286 |
| Design and Research of Large-Inclination Screw Conveyor Angle Changing Test<br>Equipment                       | 292 |
| Failure Analysis on Bearings of Railway Freight Cars with Tilting Bogie Y.X. Zhao and B. Zhang                 | 298 |