CHINESE JOURNAL OF MECHANICAL ENGINEERING

Vol. 29, No. 2, 2016

Contents

Mechanism and Robotics

219 **Human-Tracking Strategies for a Six-legged Rescue Robot Based on Distance and View**
PAN Yang, GAO Feng, QI Chenkun, and CHAI Xun

231 **Rapid Optimization of Tension Distribution for Cable-Driven Parallel Manipulators with Redundant Cables**
OUYANG Bo and SHANG Weiwei

239 **Accuracy Analysis and Design of A3 Parallel Spindle Head**
NI Yanbing, ZHANG Biao, SUN Yupeng, and ZHANG Yuan

250 **Synthesis of Branched Chains with Actuation Redundancy for Eliminating Interior Singularities of 3T1R Parallel Mechanisms**
LI Shihua, LIU Yanmin, CUI Hongliu, NIU Yunzhan, and ZHAO Yanzhi

Dynamics, Fluid Machinery, and Microfluidic

260 **Nonlinear Vibration Induced by the Water-film Whirl and Whip in a Sliding Bearing Rotor System**
ZHAI Liming, LUO Yongyao, WANG Zhengwei, KITAUCHI Seishiro, and MIYAGAWA Kazuyoshi

271 **Effects of Unbalance Location on Dynamic Characteristics of High-speed Gasoline Engine Turbocharger with Floating Ring Bearings**
WANG Longkai, BIN Guangfu, LI Xuejun, and LIU Dingqu

281 **Nonlinear Dynamic Analysis of Coupled Gear-Rotor-Bearing System with the Effect of Internal and External Excitations**
ZHOU Shihua, SONG Guiqiu, REN Zhaohui, and WEN Bangchun

293 **Application of Dual-blade Stator to Low-speed Ratio Performance Improvement of Torque Converters**
WU Guangqiang and WANG Lijun

301 **Robust Design Optimization Method for Centrifugal Impellers under Surface Roughness Uncertainties Due to Blade Fouling**
JU Yaping and ZHANG Chuhua

315 **CFD Investigation of the Influence of Volute Geometrical Variations on Hydrodynamic Characteristics of Circulator Pump**
WU Denghao, YUAN Shouqi, REN Yun, MU Jiegang, YANG Youdong, and LIU Jian

325 **Continuous Separation of Multiple Size Microparticles using Alternating Current Dielectrophoresis in Microfluidic Device with Acupuncture Needle Electrodes**
TAO Ye, REN Yukun, YAN Hui, and JIANG Hongyuan

Advanced Manufacturing Technology

332 **Optimization of Steel Bar Manufacturing Process Using Six Sigma**
NAEEM Khawar, ULLAH Misbah, TARIQ Adnan , MAQSOOD Shahid, AKHTAR Rehman, NAWAZ Rashid, and HUSSAIN Iftikhar

342 **Finite Element Simulation of Flexible Roll Forming with Supplemented Material Data and the Experimental Verification**
YAN Yu, WANG Haibo, LI Qiang, and GUAN Yanzhi

351 **Welding Polarity Effects on Weld Spatters and Bead Geometry of Hyperbaric Dry GMAW**
XUE Long, WU Jinming, HUANG Junfen, HUANG Jiqiang, ZOU Yong, and LIU Jian

357 **Constitutive Model of Friction Stir Weld with Consideration of its Inhomogeneous Mechanical Properties**
ZHANG Ling, MIN Junying, WANG Bin, LIN Jianping, LI Fangfang, and LIU Jing

Measurement and Fault Diagnosis

365 **Nondestructive Testing and Characterization of Residual Stress Field Using an Ultrasonic Method**
SONG Wentao, XU Chunguang, PAN Qinxue, and SONG Jianfeng

372 **Quantitative Metal Magnetic Memory Reliability Modeling for Welded Joints**
XING Haiyan, DANG Yongbin, WANG Ben, and LENG Jiancheng

378 **Novel Linear Piezoelectric Motor for Precision Position Stage**
CHEN Chao, SHI Yunlai, ZHANG Jun, and WANG Junshan

386 **Fault Diagnosis for Manifold Absolute Pressure Sensor(MAP) of Diesel Engine Based on Elman Neural Network Observer**
WANG Yingmin, ZHANG Fujun, CUI Tao, and ZHOU Jinlong

396 **Intelligent Diagnosis of Short Hydraulic Signal Based on Improved EEMD and SVM with Few Low-dimensional Training Samples**
ZHANG Meijun, TANG Jian, ZHANG Xiaoming, and ZHANG Jiaojiao

406 **Product Modular Design Incorporating Preventive Maintenance Issues**
GAO Yicong, FENG Yixiong, and TAN Jianrong

Production Scheduling and Quality Control

421 **Storage Assignment Optimization in a Multi-tier Shuttle Warehousing System**
WANG Yanyan, MOU Shandong, and WU Yaohua

430 **Improved Quality Prediction Model for Multistage Machining Process Based on Geometric Constraint Equation**
ZHU Limin, HE Gaiyun, and SONG Zhanjie

Friction and Wear

439 **Tribological Properties of Few-layer Graphene Oxide Sheets as Oil-Based Lubricant Additives**
CHEN Zhe, LIU Yuhong, and LUO Jianbin