2024 3rd International Conference on Advanced Sensing, Intelligent Manufacturing (ASIM 2024)

Wuhan, China
20-22 December 2024

IEEE Catalog Number: CFP24DA4-POD
ISBN: 979-8-3315-2446-3

Copyright © 2024 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP24DA4-POD
ISBN (Print-On-Demand): 979-8-3315-2446-3
ISBN (Online): 979-8-3315-2445-6

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2024 3rd International Conference on Advanced Sensing, Intelligent Manufacturing (ASIM)

ASIM 2024

Table of Contents

Preface ..... **x**
Committee Members ..... **xi**

Articles

Research on the Equivalent Simulation Experimental Method of Asymmetric Motion 1
Liang Xuan (Jianghan University, China), Zhenfei Yuan (Jianghan University, China), Shuai Dong (Jianghan University, China), Yongkang Shen (Jianghan University, China), Jiaxin Dong (Jianghan University, China), and Yuanyuan Yi (Jianghan University, China)

Design and Implementation of a High-Temperature and High-Speed Monitoring and Analysis System Based on Labview 6
Haoqi Xu (Jianghan University, China) and Lijun Meng (Jianghan University, China)

Study on BPNN-GRNN-GPR Model for Tool Wear Value and Tool Life Prediction 12
Cuiya Liu (Hunan International Economics University, China), Honghua Liu (Hunan International Economics University, China), Wenping Tan (Hunan International Economics University, China), and Xiaoling Zhou (Hunan International Economics University, China)

Joint Calibration Algorithm of Extrinsic Parameters of LiDAR-INS for Unmanned Surface Vehicle 17
Huakang Liu (Jiangsu Automation Research Institute, China), Jiazhou He (Jiangsu Automation Research Institute, China), Qing Cai (Jiangsu Automation Research Institute, China; CSSC Beijing Intelligent Equipment Technology Co., Ltd, China), Ronghe Jin (Wuhan University, China), Jingshi Wang (Jiangsu Automation Research Institute, China; Shanghai Jiao Tong University, China), Jianqiu Hu (Jiangsu Automation Research Institute, China), and Zhi Gao (Wuhan University, China)

Research on Moxibustion Robot Design and Closed-Loop Control Technology 24
Liang Xuan (Jianghan University, China), Ao Shen (Jianghan University, China), Wuxin Yu (Jianghan University, China), and Shaowei Teng (Jianghan University, China)

YOLOv8 Lightweight Crop Disease Detection 30
Yifeng Gao (Jianghan University, China), Heping Peng (Jianghan University, China), Xiaoling Li (Jianghan University, China), and Afei Gao (Jianghan University, China)

Preparation and Performance of a Gas Sensor Based on SnO2 Nanospheres 34
Chenwei Zhang (Hefei University of Technology, China), Lijun Qian (Hefei University of Technology, China), Shenglin Wen (Chongqing University, China), and Wen Zeng (Chongqing University, China)

Research on the Theory and Methodology of Wind Turbine Bearing Downscaling Tests 39
Liang Xuan (Jianghan University, China), Shaowei Teng (Jianghan University, China), Haowei Yu (Jianghan University, China), Changxin Yu (Wafangdian Bearing Group Corp., Ltd, China), and Xue Liu (Wafangdian Bearing Group Corp., Ltd, China)

Applications of Dielectric Characterization Methods in Measuring the Mechanical Properties of Polymers 44
Mengzhuo Qi (Jianghan University, P. R. China), Yixuan Li (Jianghan University), Yuhan Zhou (Jianghan University, P. R. China), Cheng Jian (Jianghan University, P. R. China), Xiaohong Yu (Jianghan University, P. R. China), and Yi Zhang (Jianghan University, P. R. China)

The Parameter Design and Modeling of the Direct Seeding Machine with Combination Holes 50
Juan Huang (Hunan Agricultural University, China), Baokui Yan (Changsha University of Science and Technology, China), Zeliang Xiao (Changsha University of Science and Technology, China), and Songlin Sun (Hunan Agricultural University, China)

Simplified Method for Special-Shaped Body in Simulation Analysis of Structural Dynamic Characteristics 54
Qin Zhou (Chongqing Vocational Institute of Engineering, China), Feng Yu (Chongqing Vocational Institute of Engineering, China), and Jun Xie (Chongqing Vocational Institute of Engineering, China)

Rapid Reconstruction of Real-World 3D Models for 3D Printing using NeRF 59
Zhen Wang (Jianghan University, P. R. China), Yi Zhang (Jianghan University, P. R. China), Runze Xiang (Wuhan Britain-China International School, P. R. China), Ziyue Yuan (Wuhan Britain-China International School, P. R. China), Jiale Zhou (Wuhan Britain-China International School, P. R. China), Lin Zhang (Jianghan University, P. R. China), and Fancong Zeng (Jianghan University, P. R. China)

Research on Terrain Matching Navigation Method Combining Cross-Correlation and Decay Memory 64
Xiao Zhou (Wuhan University of Technology, China) and Jiong Zhao (Wuhan University of Technology, China)

Electric Vehicle Charging Path Scheduling using Real-Time Road Network Data 69
Bin Zhou (Wuhan University of Technology, China), Tong Xu (Wuhan University of Technology, China), Yuxi Shi (Wuhan University of Technology, China), and Hongda Luo (Wuhan University of Technology, China)

Aircraft Cluster Cooperative Positioning Method Based on Multi-Target Data Association 76
Wenkai Peng (Wuhan University of Technology, China), Xingang Mou (Wuhan University of Technology, China), and Xiao Zhou (Wuhan University of Technology, China)

Research on Defect Detection Method for PCB Components Based on Improved YOLOv8 83
Bin Zhou (Wuhan University of Technology, China), Yuxi Shi (Wuhan University of Technology, China), Tong Xu (Wuhan University of Technology, China), and Hongda Luo (Wuhan University of Technology, China)

Study of Fiber Optic Sensing Monitoring on Ultra-High Performance Concrete Considering Shear-Lag Correction 90
Zehong Fu (Wuhan University of Technology, China), Han Song (Wuhan University of Technology, China), and Junyong Liu (Wuhan University of Technology, China)

Calculation Method for Residual Strength of Tungsten-Copper Alloy After Hole-Drilling for Crack Arrest Based on a Thermomechanical Equivalent Phase-Field Model Combined with Multi-Fidelity Neural Network 95
Bowen Liu (China Aerodynamics Research and Development Center, China), Guishan Wang (China Aerodynamics Research and Development Center, China), Yisheng Yang (China Aerodynamics Research and Development Center, China), and Yin Li (China Aerodynamics Research and Development Center, China)

Research on Key Technologies of Intelligent Acupuncture Robot 101
Liang Xuan (Jianghan University, China), Yufei Xu (Jianghan University, China), Hong-xing Zhang (Jianghan University, China), Yifeng Li (Jianghan University, China), Xiao-li Pan (Hubei University of Chinese Medicine, China), and Chun Sun (First Teaching Hospital of Tianjin University of Traditional Chinese Medicine, China)

Research on the Influence of Assembly Error of Hemispherical Resonator Gyroscope on Frequency Splitting 106
Lishan Yuan (Harbin Institute of Technology, China), Zhennan Wei (Harbin Institute of Technology, China), Ning Wang (Harbin Institute of Technology, China), Ronghao Xie (Harbin Institute of Technology, China), and Qingshuang Zeng (Harbin Institute of Technology, China)

Design of Intensity-Modulated Urodynamic Fiber-Optic Pressure Sensor 111
Xueyao Jiang (Wuhan University of Technology, China) and Yi Liu (Wuhan University of Technology, China)

Life Prediction of Nitrile Rubber Seals under Hydrogen Permeation Based on Fracture Mechanics 116
Xiaojun Zhang (Beijing University of Technology, China), Xingkuo Qiao (Beijing University of Technology, China), Yang Miao (Beijing University of Technology, China), Di Wu (Shanghai Ocean University, China), and Yifeng Huang (Zhen-O Co. Ltd, China)

Dynamic Weight Optimization for Health Index Construction in Mass Spectrometer Ion Sources... 121
Yang Miao (Beijing University of Technology, China), Zehao Li (Beijing University of Technology, China), Sen Wang (Beijing University of Technology, China), and Qi Huang (Beijing University of Technology, China)

Analysis of Condition-Based Calibration for TDLAS Oxygen Sensors in Aircraft Fuel Tanks 126
Xunwen Su (Beijing Forestry University, China), Xiawei Li (Beijing Forestry University, China), Yang Miao (Beijing University of Technology, China), Ludan Li (Chinese Flight Test Establishment, China), and Hongwei Jiang (Chinese Flight Test Establishment, China)

Laser Direct Writing of CGH for Aspherical Surface Testing 131
Junyi Lu (Zhejiang University, China) and Cuifang Kuang (Zhejiang University, China)

Principle of Ultra-High-Speed Parallel Acquisition and Demodulation of Fiber Bragg Grating Spectra 137
Yiqi Chen (Wuhan University of Technology, China), Yanfang Wang (AECC Sichuan Gas Turbine Research Institute, China), Yi Liu (Wuhan University of Technology, China), and Han Song (Wuhan University of Technology, China)

Study on the Influence of Thermal Radiation Wavelength Control on Radiative Cooling 142
Fenghui Piao (Wuhan University of Technology, China), Li Wei (Wuhan University of Technology, China), Yi Liu (Wuhan University of Technology, China), and Ying Zhang (Wuhan University of Technology, China)

Miniaturized Fiber Bragg Grating High Pressure Sensor Encapsulated by Metal Capillary Tube..... 147
Aote Yang (Wuhan University of Technology, China), Li Wei (Wuhan University of Technology, China), Yi Liu (Wuhan University of Technology, China), and Wenhong Cao (Rein Hytec Co., Ltd, China)

Theoretical Analysis and Surface Design Optimization of PMMA Fresnel Lens 152
Yingsong Gou (Wuhan University of Technology, China), Liu Hong (Wuhan University of Technology, China), Yi Liu (Wuhan University of Technology, China), and Fan Chen (Zhejiang Rein Hytec Co., Ltd., China)

Modeling and Finite Element Analysis of Ditching Tools for Intelligent Grounding Construction Equipment in Mountainous Areas 157
Yongxing Zou (Hunan Electric Power Transmission & Transformation Engineering Company Limited, China), Xin Zhou (Hunan Electric Power Transmission & Transformation Engineering Company Limited, China), Daming Guo (Hunan Electric Power Transmission & Transformation Engineering Company Limited, China), Hao Cheng (Hunan Electric Power Transmission & Transformation Engineering Company Limited, China), Litao Chen (Hunan Electric Power Transmission & Transformation Engineering Company Limited, China), Sheng Wang (Hunan Electric Power Transmission & Transformation Engineering Company Limited, China), and Xin Li (Hunan Electric Power Transmission & Transformation Engineering Company Limited, China)

An Adaptive Robust Control Method of Position Tracking for Electro Hydraulic Servo System Subject to Force Loading Disturbance 162
Peng Zhu (No.724 Research Institute of CSSC, China), Zhiwen Peng (No.724 Research Institute of CSSC, China), Yue Huang (No.724 Research Institute of CSSC, China), and Bin Dai (No.724 Research Institute of CSSC, China)

Design of Unburned Ammonia Emission Monitoring System for Marine Ammonia Low-Speed Engine 167
Lei Hu (Wuhan University of Technology, China), Xu Wang (Wuhan University of Technology, China), YaoYu Pan (Wuhan University of Technology, China), Jia Hu (Wuhan University of Technology, China), and Jianguo Yang (Wuhan University of Technology, China)

Author Index **173**