

4th International Conference on Mechatronics and Computer Technology Engineering (MCTE 2021)

Journal of Physics: Conference Series Volume 2113

Xi'an, China
15-17 October 2021

ISBN: 978-1-7138-5084-7
ISSN: 1742-6588

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

This work is licensed under a Creative Commons Attribution 3.0 International Licence.
Licence details: <http://creativecommons.org/licenses/by/3.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Preface

Peer review declaration

MECHANICAL POWER CONTROL AND SENSOR DESIGN

Human-posture-tracking sensor selection for motion recognition.....	1
<i>Chongwei Tan</i>	
Decentralized Path Planning for Multi-Objective Robot Swarm System.....	7
<i>Zhuokai Wu</i>	
Control strategy of optimal distribution of feet forces for quadruped robots based on virtual model.....	19
<i>Xinjie Chen, Yuegang Tan, Ruiya Li, Yecheng Mei</i>	
Research on Optical Fiber Sensor Signal Processing Technology Based on Variational Mode Decomposition and Singular Spectrum Analysis	28
<i>Zhehao Dong, Yanhong Ding, Zhili Zhang, Haiqiang Zhu</i>	
Waterway control assembly for rope core drilling rig and its application method.....	33
<i>Dong Fan, Feifei Lu</i>	
Design and Experimental Study of Array Eddy Current Sensor for Internal Inspection of Natural Gas Pipeline.....	37
<i>Qingxiang Zhou, Gangqing Li, Kai Hou, Feng Cao, Kai Song</i>	
Gear tooth breakage analysis based on multi-order modulated sideband RMS trending method	48
<i>Jian'Gang Chen, Zhi Luo, Ronggen Wu, Haiyang Cai</i>	
Different improvement designs of conventional comparator	53
<i>Xinmiao Fu, Miao He, Yuan Zhang</i>	
Design and simulation analysis of vacuum fish suction pump.....	71
<i>Ziyang Ding, Lingfeng Xu, Ming Gao, Guoqing Wang</i>	
SELNN: Effective Crossover Features by Attention Mechanism and Logarithmic Conversion for CTR.....	76
<i>Lu Meng, Li Wang</i>	
Estimation of Vehicle Longitudinal Speed Based on Improved Kalman Filter.....	83
<i>Qiang Zhang, Jun Xiao, Xiuhao Xi</i>	
QoS-Aware Power Allocation for Multi-UAV Aided Networks.....	90
<i>Xiaoya Quan</i>	
A Novel Post Process Method For Smoothed Particle Hydrodynamics by Interpolation on Specified Slice Plane	99
<i>Yanli Li, Junhang Guo</i>	
Feature extraction and recognition of rotating machinery fault noise based on convolutional neural networks	104
<i>Yongshao Xu, Bingzheng Liu, Haotian Shang, Yueqi Ge</i>	

Virtual DC Motor Stability Control Method Considering New Energy Generation Fluctuation	110
<i>Yilun Tan, Yucheng Wang</i>	
Internal Leakage Prediction of Hydraulic Spool valves Based on Acoustic Emission Technology.....	116
<i>Fei Song, Likun Peng, Jia Chen, Benmeng Wang</i>	
Ship tracking based on the fusion of Kalman filter and particle filter	123
<i>Wanjin Xu, Jiyong Li, Junjie Bai, Yingying Zhang</i>	
Design of the LADRC control system for gravimetric stabilisation platforms	132
<i>Enfan Lin, Jiangning Xu, Miao Wu, Hongyang He</i>	
Design of Intelligent Parking Control System.....	140
<i>Chunhong He, Hongchao Li, Bin Ren</i>	
Magnetic Target Position Estimation Method Based on Prior Information	149
<i>Guangfa Sun</i>	
Study on dynamic characteristics of rotor-bearing system under pitching condition	155
<i>Songcheng Pu, Yumin He, Qijiang Yang, Ming Cheng, Yupeng Wang, Zheng Wang, Yaodi Lin</i>	
Robust optimal control of a nonlinear impulsive time-delay system for 1,3-PD fed-batch culture.....	159
<i>Chao Sun</i>	
Data detection technology of wireless sensor network based on non-stationary filtering	164
<i>Xinghua Lu, Jiahao Huang, Guohua Luo</i>	
A High Speed Redundant IO Bus for Energy Power Controller System.....	172
<i>Qinghui Lou, Liguang Sun, Haisong Lu, Weifeng Xu, Zhebei Wang, Dan Cai, Xiangjian Shi</i>	
Sum Rate Analysis for Massive MIMO Downlink With MRC Beamforming and User Selection.....	178
<i>Yiyang Wu, Chang Chang, Fei Xie, Dacheng Ju, Yilun Pan</i>	
Application in photovoltaic MPPT based on improved hysteresis loop comparison method.....	187
<i>Liqun Shang, Fan Li</i>	
Solving Multiple Triggering Problem of Ultrasonic Distance Measurement by Debouncing.....	193
<i>Zhenhua Xiang</i>	
Design of High Distance Diameter Ratio Wireless Transmission System Based On LCC-S Compensation Network	197
<i>Aiwei Yang, Wei Xie, Tao Liu, Xiaobin He</i>	
Research on Frequency Characteristics of VSG Virtual Parameter Adaptive Control Strategy Based on Fuzzy Control Theory.....	202
<i>Jie Jin, Lan Li, Haiyang Yu, Shengzhou Feng</i>	
The application of Deep Reinforcement Learning in Coordinated Control of Nuclear Reactors	210
<i>Jing Li, Yanyang Liu, Xianguo Qing, Kai Xiao, Ying Zhang, Pengcheng Yang, Yue (Marco) Yang</i>	
Layout Guide for Design of a Novel Wheelchairs with Circumferential Linkage using Microsoft Word.....	218
<i>Zhilin Zhao</i>	

Design and Implementation of an Augmentative and Alternative Communication System Based on MATLAB GUI	225
<i>Zihe Wang, Boyu Si, Jingwen Wang</i>	
Automatic Assembly of Bolts and Nuts Based on Machine Vision Recognition	230
<i>Haocheng He</i>	
Which one is better: Assessment and Locomotion imitation strategies in Changing Environments	235
<i>Cunying Chen, Hua Zhang</i>	

ELECTRICAL CIRCUIT DEVICE AND SMART GRID DETECTION

Development of a 125% Load Brake Test Instrument for Elevator	241
<i>Pengzhao Zhang, Shuangchang Feng, Liang Fang, Shengjie Liu</i>	
Optimization of Inspection Plan for Transformer Verification Line Under Uninterrupted State	246
<i>Shunsheng Guo, Bitao Yin, Xiang Sun, Zhao Peng, Xiaobin Tu</i>	
A spatial-temporal correlation based method for advanced persistent threat detection	254
<i>Luoli Wang</i>	
An Absolute-value Detector with Threshold Comparing for Spike Detection in Brain-machine Interface	261
<i>Mingzheng Yuan</i>	
Realization and optimization of a new spike detection algorithm logic circuit	271
<i>Yuefeng Gao, Qingxing Liu, Hengji Ye</i>	
Design and Application of Automatic Calibration Device for Multi-Channel Resistance Strain Gauge Indicator	283
<i>Xiaoyin Hu, Ye Li, Haoyu Zhang, Yueling Yu, Zhangyi Kang</i>	
Design of high precision mechatronic-hydraulic leveling system for vehicle-mounted radar	288
<i>Jun Xiao, Yanchao Wang, Xiangyu Li, Jie Zheng</i>	
Rotating equipment fault noise location based on adaptive beamforming algorithm	296
<i>Yongshao Xu, Bingzheng Liu, Haotian Shang, Mingduo Wang</i>	
Improved Design of a 4-bit Absolute-Value Detector Using Simplified Chain Carry Adder	301
<i>Xinhang Dong, Boyuan Jing, Xiang Yang</i>	
A New Type of Sliding Mode Observer for Permanent Magnet Synchronous Motor Control	311
<i>Sheng Cheng, Yu-Fa Xu</i>	
Research on Robustness of Related Images for Power Equipment Inspection	318
<i>Chunlei Zhou, Xiangzhou Chen, Wenli Liu, Tianyu Dong, Huang Yun</i>	
Dynamic equivalence of doubly-fed wind turbines based on parameter identification and optimization	325
<i>Yaxin Li, Jie Yang, Bainian Yi, Rengcun Fang, Dongyin Zhang</i>	
An Intelligent Fault Diagnosis Method for CNN-SVM Circuit Breaker Based on Quantum Particle Swarm Optimization	334
<i>Zhongting Huang, Longying Wang, Qiyun Ge, Yongyi Chen, Dan Zhang</i>	

Design and research of temperature measurement system for intermediate joint of 10kV power cable	342
<i>Mengting Mao, Zhuan Liu, Rui Xu, Longwei Wang</i>	
Linear Active Disturbance Rejection Control based on Finite Impulse Response filter for harmonic control in microgrid.....	348
<i>Xiong Yang, Xuhui Zhang, Jiahao Guo</i>	
Intrusion Detection Method of Electric Power Information Network in Cloud Computing Environment	363
<i>Jiaqi Zhang, Guoping Feng, Dexi Zhou, Mingjiu Li</i>	
Research on latent defect detection technology of high voltage cable	369
<i>Sanwei Liu, Chao Qiu, Yi Xie, Jianjia Duan, Fuyong Huang, Xiaoli Duan, Zeyu Zeng</i>	
Research progress of fault detection equipment and methods for track train's shape part	374
<i>Yingqi Hao, Kun Xie, Zhepu Xu</i>	
A novel current differential protection for MMC-HVDC lines	388
<i>Yu Qin, Minghao Wen, Yu Bai, Yuxi Wang, Zeya Fang</i>	
Intelligent support and command system based on WAPI terminal equipment	396
<i>Yu Wang, Zongchun Wei, Haibo Bao, Gaofeng Deng, Jiangwei Li, Pei Li, Leigang Nie, Hua Fu</i>	
Research on dynamic current sharing method of parallel connected IGBT modules for NPC three level converters.....	403
<i>Xi Peng, Sheng Yin, Yingqin Zou</i>	
Active and reactive power coordinated optimal dispatch in active distribution network based on model predictive control.....	410
<i>Hanbing Qu, Zheng Xu, Bo Wang, Pu Zhao</i>	
Design of Smoke Alarm Dispenser Based on Single-chip Microcomputer	419
<i>Yang Wang, Lichun Han, Yonghui Zhao, Yuquan Xue, Liming Wang</i>	
Design of entertainment drone with rotating LED display technology	425
<i>Anhua You, Jiahao Li, Zifang Xu, Wencong Liu</i>	
A design of laser array harp based on multi-dimensional wavelet transform and audio signal reconstruction	429
<i>Bin Liu, Yan Ren</i>	
Research on 5G positioning technology for urban canyon.....	435
<i>Xin Xiong, Shumin Liu</i>	
Analysis and Testing of the Dynamic Characteristics of Rotor Worktable	442
<i>Jianmin Wang, Dong Liu, Yi Bian</i>	
Anomaly detection in multi-class time series.....	448
<i>Weihong Wang, Zhuolin Wu, Xuan Liu, Lei Jia, Xiaoguang Wang</i>	
GAN Image Generation and Detection Technology Based on Fractal Dimension.....	456
<i>Yuheng Guo</i>	
The High-Speed Low-Power Dynamic Comparator	463
<i>Menghua Cao, Weixun Tang</i>	

COMPUTER TECHNOLOGY AND DATA MODEL ALGORITHM IDENTIFICATION

Progress in Data Transmission and Storage for Long Pulse Data Acquisition System	478
<i>Yu Gu, Mengqi Fan, Chuanqian Tang, Guojing Zhang, Xiaodan Zhang</i>	
Panoramic image mosaic method based on image segmentation and Improved SIFT algorithm	487
<i>Lei Zhuang, Jiyan Yu, Yang Song</i>	
Comparative analysis of dynamic state recognition between permutation entropy and weighted permutation entropy.....	495
<i>Wenxiang Luo, Li Wan, Hui Liu</i>	
Fault-tolerant architecture for Cache : Summaries, Assessments and Trends	500
<i>Xuru Wang, Xin Gao, Zongnan Liang, Jiawei Nian, Hongjin Liu</i>	
Stiffness modelling of flexible support module for Large-aperture laser transmission unit.....	509
<i>Jiabin Pan, Yanan Zhang, Zhongtao Fu, Linyong Shen</i>	
A new method for solving the linear recurrence relation with nonhomogeneous constant coefficients in some cases	520
<i>Ben-Chao Yang, Xue-Feng Han</i>	
Simulation of two dimensional OCDMA-PON system based on FBGs	524
<i>Mingzhu Zheng, Qiwu Wu, Yang Zhou, Lingzhi Jiang, Jiaqi Liu</i>	
Ship classification based on random forest using static information from AIS data	531
<i>Yitao Wang, Lei Yang, Xin Song, Xuan Li</i>	
Research on Accurate Location Algorithm of Optimized Multi-source Data Fusion Based on Improved GRU Network	537
<i>Zhongzhi Li, Xiaoxue Li, Yufeng Huang</i>	
Research on threat detection in cyber security based on machine learning	544
<i>Qiwei Ke</i>	
Optimization of operation sequencing based on GA-Jaya algorithm	557
<i>Kai Zheng, Rui Zhang, Zhen-Wei Zhu, Hua-Dong Zhao</i>	
Robot physical modeling based on matlab/simulink	568
<i>Zhiyong Wu, Hongping Wang, Yiwen Zhang, Minglu Ai</i>	
ABB robot data collection based on dynamic link library.....	574
<i>Zhiyong Wu, Hongping Wang, Yiwen Zhang, Minglu Ai</i>	
Application of Fuzzy Neural Network PID In Laser-guided Mortar Projectile.....	580
<i>Yang Song, Fangxiu Jia, Xiaoming Wang, Dingming Meng, Lei Zhuang</i>	
Research on intelligent early warning system of rail transit line trip based on pscada.....	586
<i>Yuqing Zhang, Xiaohong Zhang</i>	
Pavement State Recognition Method Considering Slope	591
<i>Xiuhao Xi, Jun Xiao, Qiang Zhang, Yanchao Wang</i>	
Finger joint angle estimation based on sEMG signals by Attention-MLP	600
<i>Zhebin Yu, Hui Wang, Wenlong Yu</i>	

Identifying important nodes from content-associated heterogeneous graph by LeaderRank	607
<i>Yulong Dai, Qiyu Shen, Xiangqian Xu, Jun Yang</i>	
HHL Analysis and Simulation Verification Based on Origin Quantum Platform.....	614
<i>Xiaonan Liu, Lina Jing, Lin Han, Jie Gao</i>	
A simplified algorithm for 3D mesh model considering the influence of edge features	625
<i>Rumeng Lv, Xiaobing Chen, Bingying Zhang</i>	
Research on recommendation algorithm of Graph attention Network based on Knowledge graph	632
<i>Yiping Zeng, Shumin Liu</i>	
MRDRL-ROS: a Multi Robot Deep Reinforcement Learning Platform based on Robot Operating System	639
<i>Zhongxuan Cai, Zhen Liang, Jing Ren</i>	

Author Index