

# 计算机测量与控制

2024年8月 第32卷 第8期

## 目 次

### ● 综述与评论 ●

液体火箭发动机故障诊断系统冗余容错技术研究综述 ..... 盖佳林, 张艳, 马兵兵(1)

### ● 测试与故障诊断 ●

地球站设备自动化性能测试系统设计与实现 ..... 戴昱彤, 虞炳文, 杨海坪(8)  
基于双向AC算法的列车通信网络异常入侵检测系统设计 ..... 贾寒霜, 张卡, 杨碎明(14)  
大视场三维姿态角光学测量系统设计 ..... 张永胜, 刘海珂, 赫海涛, 张亚军(20)  
基于激光雷达与机载光电成像融合的高速轨道形变检测系统设计 ..... 晏雯秀, 谢国坤, 肖焕丽(27)  
云网融合中分布式网络入侵路径跟踪检测方法 ..... 杨波, 蒋金陵, 徐胜超, 王宏杰, 毛明扬, 蒋大锐(34)  
融合转置卷积的YOLOv3吸烟检测算法 ..... 龚英杰, 沈希忠(40)  
基于改进DDNet的皮带输送机位移故障诊断研究 ..... 高飞(47)  
基于自适应局部交替遗传算法的线缆绝缘厚度检测 .....  
..... 刘付渝杰, 马宏园, 许浩然, 宋俊儒, 罗睿, 李杨(55)  
基于深度学习方法的传送带缺陷检测 ..... 钟信, 彭力(64)  
改进的经验模态分解方法和解析能量算子在电机轴承故障诊断中的应用 .....  
..... 姚丹, 孙敏, 李睿敏, 付锐, 南江萍(72)  
数字专网的通信终端与加密组件测试系统设计 ..... 孟珞珈, 郭元兴, 刘皓(78)  
基于多视图融合的微弱缺陷检测增强方法 ..... 邵天成, 吴静静(86)  
基于小波分析的航空发动机起动过程失速检测系统设计 ..... 曹桂林, 申妙芳(93)  
基于LoRa无线传感网络的农业温室大棚环境测控系统设计 ..... 王楠(100)  
基于区块链技术的网络通信数据泄露自动检测系统设计 ..... 秦浩, 薛伟, 郭振, 陈今(108)  
基于多尺度工况增强网络及Informer的设备剩余寿命预测 ..... 刘付渝杰(115)  
基于动态分布适应网络的跨项目缺陷预测 ..... 章树卿, 周世健, 毛敬恩, 樊鑫(123)  
基于ICEEMDAN和PSO-LSSVM的石油机械滚动轴承故障诊断方法研究 .....  
..... 郑立朝, 宋宏志, 顾启林, 章宝玲, 安宏鑫, 张瀚阳, 别锋峰(129)  
基于IGA-BP神经网络的智能电能计量设备状态自动检测系统 ..... 卢旋(138)

### ● 控制技术 ●

基于改进樽海鞘群算法的飞行器航迹自适应控制系统设计 ..... 方霞(145)  
Paillier同态加密下车辆协同自适应预测巡航控制 ..... 杨敏艺, 宋秀兰, 杨燕玲, 柴伟豪(153)  
基于大数据聚类的飞行探测器复合跟踪控制系统设计 ..... 周怡伶, 陶金, 王建刚(161)

基于势场蚁群算法的仓储搬运机器人避障控制方法	陈楠,乔立春(168)
基于双环滑模控制的全向移动工业机器人多目标点跟踪控制系统设计	周峻水(174)
基于正弦函数的自动驾驶电动汽车换道控制系统设计	赵红妮(181)
基于串口的TMS320F2812软件升级方法研究与实现	许廷金,朱虹,袁鑫全,杨爱武(188)
基于机器视觉的图书机器人取书路径控制方法研究	贾瑞,强颖,赵峰(194)
基于动态Transformer的监控视频摘要系统设计	阮志坚,彭力(201)
P2混联式混合动力汽车的液压控制系统设计	孙希岗,何海龙(209)
基于现场总线和实时网络的某射流风洞安全连锁与状态监控系统研制及应用	黄昊宇,凌忠伟,刘为杰,吴琦,肖晋(215)
准零刚度磁悬浮隔振平台主动混合控制系统设计	颜枫,窦硕,陈璐(222)

## ● 设计与应用 ●

基于改进YOLOv5的车辆红外图像多目标识别方法	左涛,周慧龙,原伟哲(228)
基于三维面阵激光成像系统的目标跟踪算法研究	翟亚宇,郝光耀,徐雅丽,刘玉奇(236)
基于图可解释网络的软件错误定位	邬凯胜,周世健,樊鑫(243)
基于改进的GoogleNet-ResNet算法的路基病害智能分类方法	陈登峰,杨小燕,张温,何拓航,陈俊彤(250)
改进残差网络的医学X射线影像分类与加密传输系统	汪兴阳,戴安邦,刘艳,王俊哲,陈心可(257)
基于自适应特征提取网络的复杂环境下人脸识别	李达(265)
基于MM32F5270微控制单元的智慧门禁系统设计	林博涵,程仪,朱立超,谢迎娟(272)
星间链路通信收发一体化系统设计	鲍爱达,候世豪,郭鑫,崔鹤,张鑫哲(280)
基于ISAR图像序列的目标三维重构技术	李敏敏,杨利红,吴超(287)
多策略混合的天鹰优化器	刘香怡,梁宏涛,朱洁(295)
基于改进SLAM算法的六足机器人运动轨迹规划	张锦贤,刘志雄,谢新就,刘绍平(304)
基于非线性信号的光伏组件表面清洁度识别技术	徐俊山,马廷,宋磊,张晓东(311)
接口信号设计中的故障分析与仿真	郑凡凡,严帅,祝京,朱春,周天熠,刘航宇(317)

## ● 试验与评价技术 ●

基于集成深度随机森林算法的智能电厂设备健康评估方法	庄保乾,韩路,李晓虎,高社民,刘少阳(322)
催化重整装置健康度评价	王珠,肖既磊,董秀娟,姚源(329)
基于混合架构的船舶冲击爆炸试验数据管理系统研究	李洪普,陈辉,李晓峰,陆俊杰,汪俊,李锋(336)

期刊基本参数：CN11-4762/TP\*1993\*m\*16\*300\*zh+en\*P\*¥45\*1000\*48\*2024-8

本期责任编辑：任旺芳

# COMPUTER MEASUREMENT & CONTROL

Vol. 32 No. 8 Aug. 2024

## Contents

### • Summary and Comment •

- Review of Redundancy and Fault Tolerance Techniques for Liquid Rocket Motor Fault Diagnosis System.....GAI Jialin,MI Yan,MA Bingbing(1)

### • Test and Fault Diagnosis •

- Design and Implementation on Automatic Performance Testing System for Earth Station Equipment.....DAI Yutong,YU Bingwen,YANG Haiping(8)  
Design of Abnormal Intrusion Detection System for Train Communication Network Based on Bidirectional AC Algorithm.....JIA Hanshuang,ZHANG Ka,YANG Suiming(14)  
3D Attitude Angel Optical Measurement System with Large Field of View.....ZHANG Yongsheng,LIU Haik,HE Haitao,ZHANG Yajun(20)  
Design of High-Speed Orbit Deformation Detection System Based on the Fusion of LiDAR and Airborne Optoelectronic Imaging.....YAN Wenxiu,XIE Guokun,XIAO Huanli(27)  
Network Intrusion Path Tracking and Detection Method for Cloud Network Fusion Environment .....YANG Bo,JIANG Jinling,XU Shengchao,WANG Hongjie,MAO Mingyang,JIANG Darui(34)  
YOLOv3 Smoking Detection Algorithm Fused with Transposed Convolution.....GONG Yingjie,SHEN Xizhong(40)  
Research on Displacement Fault Diagnosis of Belt Conveyor Based on Improved DDNet.....GAO Fei(47)  
Cable Insulation Thickness Detection Based on ALA-GA.....LIUFU Yujie,MA Hongyuan,XU Haoran,SONG Junru,LUO Rui,LI Yang(55)  
Belt Defect Detection Based on Deep Learning Methods.....ZHONG Xin,PENG Li(64)  
Application of Improved Empirical Mode Decomposition and Analytic Energy Operator in Motor Bearing Fault Detection.....YAO Dan,SUN Min,LI Ruimin,FU Rui,NAN Jiangping(72)  
Design of Test System for Communication Terminal and Encryption Components of Digital Private Network.....MENG Luojia,GUO Yuanxing,LIU Hao(78)  
Enhanced Method for Faint Defects Detection Based on Multi-View Fusion.....SHAO Tiancheng,WU Jingjing(86)  
Design of Stall Detection System for Aircraft Engine Starting Process Based on Wavelet Analysis.....CAO Guilin,SHEN Miaofang(93)  
Design of Agricultural Greenhouse Environment Measurement and Control System Based on LoRa Wireless Sensor Network.....WANG Nan(100)  
Design of Data Leakage Automatic Detection System for Network Communication Based on the Blockchain Technology ..QIN Hao,XUE Wei,GUO Zhen,CHEN Jin(108)  
RUL Prediction of Device Based on Multi-scale Working Condition Enhancement Network and Informer.....LIUFU Yujie(115)  
Cross-Project Defect Prediction Based on Dynamic Distributed Adaptive Networks.....ZHANG Shuqing,ZHOU Shijian,MAO Jingren,FAN Xin(123)  
Research on Rolling Bearing Fault Diagnosis Method in Petroleum Machinery Based on ICEEMDAN and PSO-LSSVM ..ZHENG Lizhao,SONG Hongzhi,GU Qilin,ZHANG Baoling,AN Hongxin,ZHANG Hanyang,BIE Fengfeng(129)  
Intelligent Energy Measurement Equipment Status Automatic Detection System Based on IGA-BP Neural Network ..LU Xuan(138)

### • Control Technology •

- Design of Aircraft Flight Trajectory Adaptive Control System Based on Improved Slap Swarm Algorithm.....FANG Xia(145)

Cooperative Adaptive Predictive Cruise Control for Vehicles with Paillier Homomorphic Encryption.....	YANG Minyi, SONG Xiulan, YANG Yanling, CHAI Weihao(153)
Design of Composite Tracking Control System for Flight Detectors Based on Big Data Clustering.....	ZHOU Yiling, TAO Jin, WANG Jiangang(161)
Obstacle Avoidance Control Method for Warehouse Handling Robots Based on Potential Ant Colony Algorithm.....	CHEN Nan, QIAO Lichun(168)
Design of Multi target Point Tracking Control System for Omnidirectional Mobile Industrial Robot Based on Double Loop Sliding Mode Control.....	ZHOU Junshui(174)
Design of Lane Change Control System for Autonomous Electric Vehicle Based on Sine Function.....	ZHAO Hongni(181)
Research and Implementation of TMS320F2812 Software Upgrade Method Based on Serial Port.....	XU Tingjin, ZHU Hong, YUAN Xinquan, YANG Aiwu(188)
Research on Path Control Method for Book Robot Retrieving Books Based on Machine Vision.....	JIA Rui, QIANG Ying, ZHAO Feng(194)
Design of Surveillance Video Summarization System Based on Dynamic Transformer.....	RUAN Zhijian, PENG Li(201)
Design of Hydraulic Pressure Control System of P2 Hybrid Electric Vehicles.....	SUN Xigang, HE Hailong(209)
Development and Application of Safety Interlock and Status Monitoring System for Jet Wind Tunnel Based on Field Bus and Real-time Network.....	HUANG Haoyu, LING Zhongwei, LIU Weijie, WU Qi, XIAO Jin(215)
Design of Active Hybrid Control System for Quasi Zero Stiffness Magnetic Suspension Isolation Platform.....	YAN Feng, DOU Shuo, CHEN Liu(222)

## ● Design and Application ●

Multi-target Recognition Method for Vehicle Infrared Images Based on Improved YOLOv5.....	ZUO Tao, ZHOU Huilong, YUAN Weizhe(228)
Research on Target Tracking Algorithm Based on Three-dimensional Array Laser Imaging System.....	ZHAI Yayu, HAO Guangyao, XU Yali, LIU Yuqi(236)
Software Fault Localization Based on Graph Interpretable Networks.....	WU Kaisheng, ZHOU Shijian, FAN Xin(243)
Intelligent Classification Method for Subgrade Disease Based on Improved GoogleNet-ResNet Algorithm.....	CHEN Dengfeng, YANG Xiaoyan, ZHANG Wen, HE Tuohang, CHEN Junlong(250)
Medical X-ray Image Classification and Encrypted Transmission System Based on Improved Residual Network.....	WANG Xingyang, DAI Anbang, LIU Yan, WANG Junzhe, CHEN Xinke(257)
Face Recognition in Complex Environment Based on Adaptive Feature Extraction Network.....	LI Da(265)
Intelligent Access Control System Design Based on MM32F5270 Micro Control Unit.....	LIN Bohan, CHENG Yi, ZHU Lichao, XIE Yingjuan(272)
Design of Transceiver Integrated System for Inter-satellite Link Communication.....	BAO Aida, HOU Shihao, GUO Xin, CUI He, ZHANG Xinzhe(280)
Target 3D Reconstruction Technique Based on ISAR Image Sequence.....	LI Minmin, YANG Lihong, WU Chao(287)
Aquila Optimizer with Multi-Strategy Integration.....	LIU Xiangyi, LIANG Hongtao, ZHU Jie(295)
Motion Trajectory Planning of Hexapod Robot Based on Improved SLAM Algorithm.....	ZHANG Jinxian, LIU Zhixiong, XIE Xinjiu, LIU Shaoping(304)
Surface Cleanliness Identification of Photovoltaic Modules Based on Non-Linear Signals.....	XU Junshan, MA Ting, SONG Lei, ZHANG Xiaodong(311)
Fault Analysis and Simulation in Interface Signal Design.....	ZHENG Fanfan, YAN Shuai, ZHU Jing, ZHOU Tianyi, LIU Hangyu(317)

## ● Test & Evaluation Technology ●

Health Status Assessment Method of Intelligent Power Plant Equipment Based on Integrated Deep Random Forest Algorithm.....	ZHUANG Baoqian, HAN Lu, LI Xiaohu, GAO Shemin, LIU Shaoyang(322)
Health Evaluation on Catalytic Reforming Units.....	WANG Zhu, XIAO Jilei, DONG Xiujuan, YAO Yuan(329)
Research on Ship Impact and Explosion Test Data Management System Based on Mixed Architecture.....	LI Hongpu, CHEN Hui, LI Xiaofeng, LU Junjie, WANG Jun, LI Feng(336)