

ISSN 1671—4598
CODEN JCYKAR



● 第三届国家期刊奖百种重点期刊

● 中国科技核心期刊

计算机测量与控制

COMPUTER MEASUREMENT & CONTROL

2023年5月 第31卷 第5期

Vol. 31 No. 5 May. 2023



主管单位：中国航天科工集团有限公司
主办单位：中国计算机自动测量与控制技术协会
出版单位：《计算机测量与控制》杂志社

计算机测量与控制

2023年5月 第31卷 第5期

目 次

● 测试与故障诊断 ●

基于压差法的风洞群高压空气资源自动计量系统设计·····	罗昌俊,马永一,何福,司洞洞,王天泽(1)
基于遗传神经网络的机场跑道局部影响的裂缝检测算法·····	陈侯秀,高建民,贺青青,高建国(7)
基于XGBoost的管道防腐层裂纹损伤识别算法研究·····	吕瑞宏,王春云,赵艺伟,王晨丽(14)
基于FPGA的运动目标远程监视系统设计·····	刘存领,林青松,于洪泽(21)
卫星热响应测试系统设计·····	江浩,宋歌,张学迅,张鹏(28)
“低慢小”目标的雷达与光电复合探测跟踪方法·····	向志强,刘波,江少锋(34)
基于改进YOLOv5s的无人机火灾图像检测算法·····	苏小东,胡建兴,陈霖周廷,高宏建(41)
基于改进YOLOv5的电厂人员吸烟检测·····	王彦生,曹雪虹,焦良葆,孙宏伟,高阳(48)
特定车速下轻型卡车驾驶室异常抖动故障诊断方法·····	王郡成(56)
基于参数联合优化VMD-SVM的工业机器人旋转部件故障诊断方法·····	王晓莹,李帅永(62)
一种采煤机截割部滚动轴承故障诊断方法·····	焦玉冰,李杰,马喜宏,郭肖亭,冯凯强(73)
基于TDL的测试系统可视化对象模型构建技术·····	胡国星,高帅华(80)
基于自监督学习的输电线路螺栓螺母异常检测技术·····	·····杨景崙,辛巍,刘全,刘晓华,孙忠慧,张治国,刘文超,王沐东,付思诗(87)
4秒微重力实验舱导轨副轴承故障分析·····	张运山,席隆(94)
多波长红外尿糖检测技术研究·····	梅竹松,严荣国,徐涛,魏梦林(101)

● 控制技术 ●

面向军事群体的聚合及解聚可视化控制模型·····	杨帆,王家润,曹占广(108)
基于CAN总线控制系统的航天特种机械臂设计·····	王博,邓鹏程,刘国英,冯超,毛利民(114)
基于高速DSP技术的低成本智能焊接机器人设计与研究·····	卢绍庆(120)
基于动态角色分配的一致性协同无人机编队控制·····	姜鸿儒,范云锋,徐亚周,董诗音,赵佳欢(126)
基于无刷直流电机控制器设计·····	田双文,刘雪松,刘佳,刘珊珊(132)
融合光谱刺激和知觉训练的近视防控装置设计与开发·····	陈宏,王丽萍,翁杭立,邱飞岳,廖俊(139)
基于FOPID+ADRC的永磁同步电机低速控制·····	冯光权,董涵,冯浩文(146)
一种直流系统变斜率VDCOL控制策略优化方法·····	谭琼亮,许琼果,郑红娟(153)
基于AI深度学习的机器人碰撞预估计控制器设计·····	王敏(160)

基于改进萤火虫算法的无人机路径规划·····龙舰涵,许湘扬(166)

● 设计与应用 ●

基于改进深度学习的风机油污识别·····李家源,曹雪虹,焦良葆,张智坚,陈 烨(174)

基于PSO-DE-BP的光伏发电功率短期预测·····刘春芳,王攀攀,曹 菲(180)

蛇形供水管道机器人头部结构设计与运动学分析·····

·····陈双叶,黄成意,张智武,张 林,韩 默,史思雨,赵婧华,吴 坤,李 志(187)

基于双种群蚁群算法的AGV路径规划研究·····刘 睿,杨程伟,高长水,李晓东(193)

基于MIL-STD-1553B的通信原理教学软件设计与开发·····周琪栋,江志东,张 弟,周 浩,班海丽(200)

一种星载软件重构系统的设计与实现·····刘伟伟,李 欣,于俊慧,穆 强,庞亚龙(207)

基于HoloLens的飞机维修远程指导系统·····崔海青,张旭鹏,詹湘琳(214)

基于FPGA加速的低功耗的MobileNetV2网络识别系统·····孙小坚,林瑞全,方子卿,马 驰(221)

基于联合训练的分类器的乳腺癌图像分类·····张晋凯,高 翔,王 鹏,白艳萍,梅银珍(228)

航空发动机加工现场生产制造网络化协同系统·····乔耀峰,董 磊,蒋 波,刘 剑(235)

高压带电作业双臂机器人系统设计·····

·····王 康,刘 亮,李慧杰,余志森,龙 飞,蒋 鑫,陈双叶,白劲松,田悦谷(243)

基于航天装备数据的知识图谱体系研究·····慈 颖,秦留洋,韩惠婕(249)

基于预留缓存的并发访问及多任务并行支撑技术研究·····党宏杰,秦留洋,韩惠婕(255)

作战标号颜色与几何视觉编码融合显示技术·····周笑语(260)

基于贪心算法的容器云资源低能耗部署方法·····徐胜超,叶朝武(265)

一种广域稀布雷达低旁瓣波束形成方法·····李鑫宇,王鹏毅,夏双志,宋 晨(271)

面向供热现场安全管理的一体化信息系统设计与实现·····王 妍(278)

基于模拟退火算法下多位相型达曼光栅分束器的设计·····史 发,蔡荣立(287)

基于盖革APD阵列的单通道激光雷达信号读出电路设计·····贾国辉,刘缠宇(293)

● 智能仪器与传感技术 ●

基于DQN和K-means聚类算法的天然气管站场仪表智能识别研究·····

·····黄知坤,文 炜,刘 明,张香怡,刘凯书,黄 腾,顾继俊(300)

期刊基本参数: CN11-4762/TP*1993*m*16*300*zh+en*P*¥45*1000*45*2023-5

本期责任编辑: 唐德生

COMPUTER MEASUREMENT & CONTROL

Vol. 31 No. 5 May. 2023

Contents

• Test and Fault Diagnosis •

Design of Automatic Metering System Based on Differential Pressure Method for High-Pressure Air Delivery of Wind Tunnel Group.....	LUO Changjun,MA Yongyi,HE Fu,SI Dongdong,WANG Tianze(1)
Crack Detection Algorithm Based on Genetic Neural Network for Runway Local Influence.....	.....CHEN Yuxiu,GAO Jianmin,HE Qingqing,GAO Jianguo(7)
Research on Rack Damage Identification Algorithm of Pipeline Anticorrosion Coating Based on XGBoost.....	.....L ü Ruihong,WANG Chunyun,ZHAO Yiwei,WANG Chenli(14)
Design of Remote Monitoring System for Moving Target Based on FPGA.....	LIU Cunling,LIN Qingsong,YU Hongze(21)
Design and Implementation on Satellite Thermal Response Test System.....	.....JIANG Hao,SONG Ge,ZHANG Xuexun,ZHANG Peng(28)
Radar and Opto-electrical Composite Detection and Tracking Method for LSS-Targets.....	.....XIANG Zhiqiang,LIU Bo,JIANG Shaofeng(34)
Fire Image Detection Algorithm for UAV Based on Improved YOLOv5s.....	.....SU Xiaodong,HU Jianxing,CHEN Linzhouting,GAO Hongjian(41)
Smoking Detection of Power Plant Personnel Based on Improved YOLOv5.....	.....WANG Yansheng,CAO Xuehong,JIAO Liangbao,SUN Hongwei,GAO Yang(48)
Fault Diagnosis Method of Light Truck Cab Abnormal Jitter at Specific Speed.....	WANG JunCheng(56)
Fault Diagnosis for Rolling Parts of Industrial Robot Based on Parameter Collaborative Optimization VMD-SVM.....	.....WANG Xiaoying,LI Shuaiyong(62)
A Fault Diagnosis Method for Rolling Bearing of Shearer Cutting Section.....	.....JIAO Yubing,LI Jie,MA Xihong,GUO Xiaoting,FENG Kaiqiang(73)
Visual Object Model of Test System Modeling Based on TDL.....	HU Guoxing,GAO Shuaihua(80)
Fault Detection Technology of Bolts and Nuts based on Self-Supervised Learning in Transmission Line.....	YANG Jingyu,XIN Wei,LIU Quan,LIU Xiaohua,SUN Zhonghui,ZHANG Zhiguo,LIU Wenchao,WANG Mudong,FU Sishi(87)
Fault Analysis of Motion Guide Bearing in 4-second Microgravity Experiment Cabin.....	ZHANG Yunshan,XI Long(94)
Research on Multi-Wavelength Infrared Urine Glucose Detection Technology.....	.....MEI Zhusong,YAN Rongguo,XU Tao,WEI Menglin(101)

• Control Technology •

Aggregation and Disaggregation Visual Control Model for Facing Military Group.....	.....YANG Fan,WANG Jiarun,CAO Zhanguang(108)
Design of Aerospace Special Manipulator Based on CAN Bus Control System.....	.....WANG Bo,DENG Pengcheng,LIU Guoying,FENG Chao,MAO Limin(114)
Design and Research of Low Cost Intelligent Welding Robot Based on High Speed DSP Technology....	LU Shaoqing(120)
Consistent Cooperative of UAV Formation Control Based on Dynamic Role Assignment .....	.....JIANG Hongru,FAN Yunfeng,XU Yazhou,DONG Shiyin,ZHAO Jiahuan(126)
Controller Design Based On Brushless DC Motor.....	TIAN Shuangwen,LIU Xuesong,LIU Jia,LIU Shanshan(132)
Design and Development of Myopia Prevention and Control Device Integrating Spectral Stimulation and Perceptual Training.....	CHEN Hong,WANG Liping,WENG Hangli,QU Feiyue,LIAO Jun(139)
Low Speed Control on PMSM Based on FOPID and ADRC.....	FENG Guangquan,DONG Han,FENG Haowen(146)

An Optimization Method of Variable Slope VDCOL Control Strategy for DC System.....TAN Qiongliang,XU Qiongguo,ZHENG Hongjuan(153)

Design of Robot Collision Pre-estimation Controller Based on AI Depth Learning.....WANG Min(160)

AUV Path Planning Based on Improved Firefly Algorithm.....LONG Jianhan,XU Xiangyang(166)

• Design and Application •

Identification of Fan Oil Contamination Based on Improved Deep Learning.....LI Jiayuan,CAO Xuehong,JIAO Liangbao,ZHANG Zhijian,CHEN Ye(174)

Short Term Prediction of Photovoltaic Power Generation Based on PSO-DE-BP.....LIU Chunfang,WANG PanPan,CAO Fei(180)

Structural Design and Kinematics Analysis of Snake-shaped Water Supply Pipeline Robot Head.....CHEN Shuangye,HUANG Chengyi,ZHANG Zhiwu,ZHANG Lin,HAN Mo,SHI Siyu,ZHAO Jinghua,WU Kun,LI Zhi(187)

Research on AGV Path Planning Based on Dual Population Ant Colony Algorithm.....LIU Rui,YANG Chengwei,GAO Changshui,LI Xiaodong(193)

Design and Development of Communication Principle Teaching Software Based on MIL-STD-1553B.....ZHOU Qidong,JIANG Zhidong,ZHANG Di,ZHOU Hao,BAN Haili(200)

Design and Implementation of A Spaceborne Software Reconfiguration System.....LIU Weiwei,LI Xin,YU Junhui,MU Qiang,PANG Yalong(207)

Remote Guidance System for Aircraft Maintenance Based on Hololens.....CUI Haiqing,ZHANG Xupeng,ZHAN Xianglin(214)

Low-power MobileNetV2 Network Identification System Based on FPGA Acceleration.....SUN Xiaojian,LIN Ruiquan,FANG Ziqing,MA Chi(221)

Breast Cancer Image Classification Based on Joint Training Classifier.....ZHANG Jinkai,GAO Xiang,WANG Peng,BAI Yanping,MEI Yinzhen(228)

Networked Collaboration System of Manufacturing in Aero-Engine Processing Field.....QIAO YaoFeng,DONG Xuan,JIANG Bo,LIU Jian(235)

Design of Dual-arm Robot System for High Voltage Power Live Working.....WANG Kang,LIU Liang,LI Huijie,YU Zhisen,LONG Fei,JIANG Xin,CHENG Shuangye,BAI Jinsong,TIAN Yuegu(243)

Research on Knowledge Graph System Based on Space Equipment Data.....CI Ying,QIN Liuyang,HAN Huijie(249)

Research on Concurrent Access and Multi-Task Support Technology Based on Reserved Cache.....DANG Hongjie,QIN Liuyang,HAN Huijie(255)

Fusion Display Technology of Combat Symbol Colors and Geometric Visual Coding.....ZHOU Xiaoyu(260)

Low Energy Consumption Deployment Method of Container Cloud Resources Based on a Greedy Algorithm.....XU Shengchao,YE Zhaowu(265)

A Beam-forming Method with Low Side-lobe for Widely Sparse Radar.....LI Xinyu,WANG Pengyi,XIA Shuangzhi,SONG Chen(271)

Design and Implementation of Integrated information System on Heat-Supply On-site Safety Management.....WANG Yan(278)

Design of Multi-phase Dammann Grating Beam Splitter Based on Simulated Annealing Algorithm.....SHI Fa,CAI Rongli(287)

Design of Single-Channel LIDAR Signal Readout Circuit Based on Geiger APD Array.....JIA Guohui,LIU Chanlao(293)

• Intelligent Instruments and Sensing Technology •

Research on Intelligent Recognition of Meters in Natural Gas Station Based on DQN and K-means Clustering Algorithm.....HUANG Zhikun,WEN Wei,LIU Ming,ZHANG Xiangyi,LIU Kaishu,HUANG Teng,GU Jijun(300)

计算机测量与控制

Jisuanji Celiang Yü Kongzhi

2023年 第31卷 第5期 (总第296期)

月刊 公开发行 1993年创刊

Computer Measurement & Control Vol.31 No.5

May, 2023 (Series 296) Monthly Started in 1993

资深顾问: 栾恩杰院士 张履谦院士 刘永才院士 于登云院士 付梦印院士

编委会主任: 潘旭东

编委会副主任: 张卫星

编委会委员(按姓氏笔画排序):

于功敬 马恩云 王军政 王海亮 王海涛 王宪保 王鑫 王涛 支超有 方华亮 凤雷 付平 叶廷东
兰智高 任祥顺 许川佩 刘才学 刘广武 刘文怡 刘亚斌 刘业峰 刘小雄 刘尊 朱纪洪 华更新 乔立岩
吕翔 邢兰昌 安朝 李剑 李凯 李祺 李旗挺 许亮 张友鹏 张航瑛 张新星 何怡刚 肖明清
吴响 吴伟 吴小明 陈建云 汪步云 周德云 庞新富 郭阳明 徐忠东 徐昕 高月红 袁海文 常天庆
龚峰 谢鑫 彭进业 温鹏 路辉 蔡小斌 蔡兴泉 廖熹 潘安君 魏清新

主管单位: 中国航天科工集团有限公司

主办单位: 中国计算机自动测量与控制技术协会

编辑出版: 《计算机测量与控制》杂志社

原刊名: 计算机自动测量与控制

社长: 张卫星

副社长: 肖登伟

主编: 苟永明

英文编辑: 史守峡

编辑部: 任旺芳 唐德生 顾捷 叶靖

通讯地址: 北京市海淀区阜成路甲8号航天科工大厦门四层

邮政编码: 100048

主编室: (010) 68371578

编辑部: (010) 68371556转12-23

广告部: (010) 68372068

传真: (010) 68372068

电子邮箱: ck@chinamca.com

投稿网址: www.jsjclyz.com

印刷: 北京成业恒信印刷有限公司

总发行处: 北京报刊发行局

订阅处: 全国各地邮局

广告经营许可证: 京海工商广字第8179号(1-1)

帐户: 《计算机测量与控制》杂志社

帐号: 11001085400059612076

开户银行: 建行北京阜成路支行

出版日期: 2023年5月25日

责任编辑: 唐德生

版权所有 未经同意 不得转载

Competent Authority: China Aerospace Science and Industry Corporation Limited

Sponsor: China Association of Computer Automated Measurement and Control Technology

Edited and Published by: Magazine Agency of Computer Measurement & Control

Senior Consultants: Luan Enjie Academician

Zhang Lüqian Academician

Liu Yongcai Academician

Yu Dengyun Academician

Fu Mengyin Academician

Director of Editorial Committee: Pan Xudong

Publisher President: Zhang Weixing

Deputy Publisher: Xiao Dengwei

Chief Editor: Gou Yongming

English Editor: Shi Shouxia

Address: 4th floor, China Aerospace Mansion, No. a8 Fucheng road, Haidian district, Beijing 100048, China

Code Name: 82-16

Overseas Postal Code Name: M1480

Publishing Date: 25th / May, 2023

Domestic Price: ¥45/Each



微信服务号



微刊阅读

刊号: ISSN 1671-4598
CN 11-4762/TP

邮发代号: 82-16

国外代号: M1480

定价: 45.00元

ISSN 1671-4598



9 771671 459237

0 5 >