

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6月 第31卷 第6期

Vol. 31 No. 6 Jun. 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6月 第31卷 第6期

目次

● 测试与故障诊断 ●

卫星测控地检板卡设计与实现·····李田甜,邵芸松,徐圣法,刘宝书,王英爽(1)

改进Petri网故障诊断算法的信道故障诊断与处理·····朱铝芬,徐媛媛(6)

基于海洋气象漂流浮标的动态测风技术研究·····薛帅宁,孔卫奇(12)

苹果采摘机器人监测系统和表面缺陷检测方法研究·····梅金波,李涛,秦寅初(19)

基于改进YOLOv5s的机坪特种车辆检测算法研究·····诸葛晶昌,李想(27)

针对新学习策略的弱小目标检测方法·····薛锦,田增娴,师庆科,文占婷(34)

基于柔性超声传感器的骨质状况检测系统·····王博智,牛麒麟,赵云楠,王伟,刘卫国,林大斌(40)

基于XGBoost的民航飞机发动机性能参数预测模型·····樊智勇,王振良,刘哲旭(46)

某发控设备一体化自动化测试系统研究·····杨幸,龚琦,范文晶,孙海涛,朱玉龙,侯如非(53)

基于绝对位移的核反应堆压力容器振动探测技术研究·····杨泰波,罗能,李芸,庞天枫(59)

小型化低成本运载火箭测控设备设计研究·····高飞,王璐璐,李芳野,谢望,韩飞,江坤,徐昕(66)

基于磁致伸缩的电磁超声钢板机械性能检测方法·····韩飞,赵新航,陈锴迪,高飞,王逸凡,徐昕(73)

基于改进YOLOv5s的四旋翼自主降落标识检测算法·····李晓轩,甄子洋,刘彪,梁永勋,黄祎闻(80)

测发控系统前置测控软件热备冗余研究·····谢望,兰旭东,高飞,赵新航,卫吉祥,徐昕(87)

基于ADG1607十六通道湿度测量电路设计·····吕雪芹,敖振浪,黄宏智(94)

基于Darknet网络和YOLO4的实时电路板故障检测算法·····赵岩,孔祥伟,马春斌,杨浩(101)

● 控制技术 ●

基于地址映射的NAND Flash控制器设计·····徐磊,王保成(109)

基于GQFD的无人智能化保障装备能力需求分析·····宋豪文,贾红丽,连光耀,张宇,王姗(117)

基于NB-IoT和OTA的云上智能井盖监控系统设计·····赵静静,田延飞(123)

一种高可靠的运载火箭测发控设备·····王之平,汪文明,王淑炜(130)

● 设计与应用 ●

失速告警系统应用异构双核处理器的安全性分析研究·····宣晓刚,魏璐达,贾少龙,杨飞,张美仙(137)

基于节点优化的改进全局路径规划A*算法·····卫彦,晋芳,董凯锋,宋俊磊,莫文琴,惠亚娟(143)

基于改进自适应卡尔曼滤波的电力大负荷预测与计费研究·····	隋仕伟,俞海猛,蹇照民,赵艳(149)
基于大数据应用的地质灾害数据存储策略·····	石晓枕,赵统永,王耀忠,彭君(156)
基于改进ResNet-50的图像特征提取网络·····	汤博宇,焦良葆,徐逸,魏小玉,孟琳(162)
基于平行泊车路径规划的智能泊车系统设计·····	张安莉,王娟,袁安中,陈奎锋,张秦阳(168)
神经网络训练处理器的浮点运算优化架构·····	张立博,李昌伟,齐伟,王刚,戚鲁凤(176)
基于轻量级AES加密算法的浮空器平台数据传输方案·····	张馨方,周江华(183)
基于蓝图可分离卷积的轻量级水下图像超分辨率重建·····	李艳,谌雨章,郭煜玮,胡世娥(191)
反应堆关键设备状态数据标准化研究·····	李书剑,庞天枫,杨泰波,刘才学(198)
面向嵌入式系统的有效值快速算法·····	马文博,罗丹,蒋玉华,张亿宗,廖志贤,黄国现(204)
一种卫星温度自主管理的优化设计·····	刘博,乔梁,毛亮,姜博(212)
基于深度学习的人脸图像加密算法研究·····	鲁瑞,张南,辛君芳(217)
一种适用于胶囊机器人的肠道几何参数感知方法·····	周锦山,高晋阳(223)
无人机智能遥感信息提取技术研究与应用·····	冯一军,陈霖,梁雄乾,王志虎,王鑫(231)
航空叶片打磨余量分析及轨迹生成·····	兰旭东,谢望,赵新航,韩飞,朱明一,孙天亮,徐昕(238)
低旁瓣反射面天线设计·····	刘胜文,王超(246)
运载火箭电磁阀判读算法设计·····	赵新航,韩飞,兰旭东,谢望,汤小双,徐昕(252)
一种水下足式机器人的设计方案研究·····	李芳野,陈锴迪,高飞,张海波,余丽佳,许晖,徐昕(259)
基于视觉的空中加油定位技术研究·····	赵敏琨,刘小雄,徐新龙,杨楠,王映龙(267)
基于深度神经网络AdaMod优化模型的来袭目标攻击意图识别·····	王家鑫,王瑞琪,孟海波,蔺红明,陈天群(274)
基于一维Logistic映射和二维Tent映射双混沌思路的网络信息加密·····	田如意,顾风军,彭坤,国栩(280)
多路起爆电路设计及特性分析·····	王一,刘择生,赵旭瑞,秦栋泽(287)

● 试验与评价技术 ●

基于DPI-C的脉动阵列模块验证平台·····	王鑫,陈博(293)
航天装备在役考核评估方法研究·····	杨萍,秦留洋,韩惠婕(299)
基于知识图谱的航空发动机PHM仿真验证平台设计·····	范满意,罗凯,马英杰,韩崇鹏(305)

期刊基本参数: CN11-4762/TP*1993*m*16*300*zh+en*P*¥45*1000*46*2023-6

本期责任编辑: 任旺芳

COMPUTER MEASUREMENT & CONTROL

Vol. 31 No. 6 Jun. 2023

Contents

● Test and Fault Diagnosis ●

Design and Implementation of Satellite Telemetry and Remote Control Local Inspection Board.....	
.....LI Tiantian,SHAO Yunsong,XU Shengfa,LIU Baoshu,WANG Yingshuang(1)	
Channel Fault Diagnosis and Processing of Improved Petri Net Fault Diagnosis Algorithm.....	
.....ZHU Lvfen,XU Yuanyuan(6)	
Research on Dynamic Wind Measurement Technology Based on Marine Meteorological Drifting Buoy.....	
.....XUE Shuaining,KONG Weiqi(12)	
Research on Apple Picking Robot Monitoring System and Surface Defect Detection Method.....	
.....MEI Jinbo,LI Tao,QIN Yinchu(19)	
Research on Apron Special Vehicle Detection Algorithm Based on Improved YOLOv5s.....	
.....ZHUGE Jingchang,LI Xiang(27)	
Detection Method of Weak and Small Targets for New Learning Strategies.....	
.....XUE Jin,TIAN Zengxian,SHI Qingke,WEN Zhanting(34)	
Bone Condition Detection System Based on Flexible Ultrasonic Sensor.....	
.....WANG Bozhi,NIU Qiming,ZHAO Yunnan,WANG Wei,LIU Weiguo,LIN Dabin(40)	
Prediction Model on Aircraft Engine Performance Parameters Based on XGBoost.....	
.....FAN Zhiyong,WANG Zhenliang,LIU Zhexu(46)	
Research on Integrated Automatic Test System of Certain Launch and Control Equipment.....	
.....YANG Xing,GONG Qi,FAN Wenjing,SUN Haitao,ZHU Yulong,HOU Rufe(53)	
Research on Vibration Detection Technology of Nuclear Reactor Pressure Vessel Based on Absolute Displacement.....	
.....YANG Taibo,LUO Neng,LI Yun,PANG Tianfeng(59)	
Research on Miniaturization and Low Cost Measurement and Control Device of Launch Vehicle.....	
.....GAO Fei,WANG Lulu,LI Fangye,XIE Wang,HAN Fei,JIANG Kun,XU Xin(66)	
Detection Method of Mechanical Properties of Steel Plate Based on Magnetostriction EMAT.....	
.....HAN Fei,ZHAO Xinhang,CHEN Kaidi,GAO Fei,WANG Yifan,XU Xin(73)	
Object Detection of Quadrotor UAV Auto-Landing Based on Improved YOLOv5s.....	
.....LI Xiaoxuan,ZHEN Ziyang,LIU Biao,LIANG Yongxun,HUANG Yiwen(80)	
Research on the Hot Standby Redundancy of the Pretest and Control Software of the Test and Control System.....	
.....XIE Wang,LAN Xudong,GAO Fei,ZHAO Xinhang,WEI Jixiang,XU Xin(87)	
Design of Sixteen-channel Humidity Measuring Circuit Based on ADG1607.....	
.....LYU Xueqin,AO Zhenlang,HUANG Hongzhi(94)	
Real-time PCB Fault Detection Algorithm Based on Darknet Network and YOLO4 Algorithm.....	
.....ZHAO Yan,KONG Xiangwei,MA Chunbin,YANG Hao(101)	

● Control Technology ●

Design of NAND Flash Controller Based on Address Mapping.....	XU Lei,WANG Baocheng(109)
Capability Analysis of Unmanned Intelligent Support Equipment Based on GQFD.....	
.....SONG Haowen,JIA Hongli,LIAN Guangyao,ZHANG Yu,WANG Shan(117)	
Design of Cloud Intelligent Manhole Cover Monitoring System Based on NB-IoT and OTA.....	
.....ZHAO Jingjing,TIAN Yanfei(123)	
A Highly Reliable Launch Vehicle Test and Control Equipment....	WANG Zhiping,WANG Wenming,WANG Shuwei(130)

● Design and Application ●

Research on Safety Analysis of Stall Warning System Using Heterogeneous Dual Core Processor.....	
.....XUAN Xiaogang,WEI Luda,JIA Shaolong,YANG Fei,ZHANG Meixian(137)	
Improved Global Path Planning A* Algorithm Based on Node Optimization.....	
.....WEI Yan,JIN Fang,DONG Kaifeng,SONG Junlei,MO Wenqin,HUI Yajuan(143)	
Research on the Prediction of Power Heavy Load Metering and Charging Based on Improved Adaptive Kalman Filter.....	
.....SUI Shiwei,YU Haimeng,JIAN Zhaoming,ZHAO Yan(149)	
Geological Disaster Data Storage Strategy Based on Big Data Application.....	
.....SHI Xiaolong,ZHAO Tongyong,WANG Yaozhong,PENG Jun(156)	
Image Feature Extraction Network Based on Improved ResNet-50.....	
.....TANG Boyu,JIAO Liangbao,XU Yi,WEI Xiaoyu,MENG Lin(162)	
Design of Intelligent Parking System Based on Parallel Parking Path Planning.....	
.....ZHANG Anli,WANG Juan,YUAN Anzhong,CHEN Kuifeng,ZHANG Qinyang(168)	
Floating Point Optimization Architecture of Neural Network Training Processor.....	
.....ZHANG Libo,LI Changwei,QI Wei,WANG Gang,QI Lufeng(176)	
Data Security Transmission Scheme of Aerostat Platform Based on Lightweight AES Encryption Algorithm	
.....ZHANG Xinfang,ZHOU Jianghua(183)	
Super-Resolution Reconstruction of Lightweight Underwater Images Based on Blueprint Separable Convolution.....	
.....LI Yan,CHEN Yuzhang,GUO Yuwei,HU Shie(191)	
Research on State Data Standardization of Critical Reactor Equipment.....	
.....LI Shujian,PANG Tianfeng,YANG Taibo,LIU Caixue(198)	
Fast Algorithm of RMS Oriented to Embedded Systems.....	
.....MA Wenbo,LUO Dan,JIANG Yuhua,ZHANG Yizong,LIAO Zhixian,HUANG Guoxian(204)	
An Optimization Design of Satellite Temperature Autonomous Management.....	
.....LIU Bo,QIAO Liang,MAO Liang,JIANG Bo(212)	
Research on Face Image Encryption Algorithm Based on Deep Learning.....	
.....LU Rui,ZHANG Nan,XIN Junfang(217)	
An Intestinal Geometric Parameters Sensing Method for a Capsule Robot.....	
.....ZHOU Jinshan,GAO Jinyang(223)	
Research and Application of UAV Intelligent Remote Sensing Information Extraction Technology.....	
.....FENG Yijun,CHEN Lin,LIANG Xiongqian,WANG Zhihu,WANG Xin(231)	
Grinding Allowance Analysis and Path Generation of Aeroengine Blades.....	
.....LAN Xudong,XIE Wang,ZHAO Xinhang,HAN Fei,ZHU Mingyi,SUN Tianliang,XU xin(238)	
Low Side Lobe Reflector Antenna Design.....	
.....LIU Shengwen,WANG Chao(246)	
Algorithm Design of Solenoid Valves Interpretation for Launch Vehicles.....	
.....ZHAO Xinhang,HAN Fei,LAN Xudong,XIE Wang,TANG Xiaoshuang,XU Xin(252)	
Research on the Design Scheme of an Underwater Legged Robot.....	
.....LI Fangye,CHEN Kaidi,GAO Fei,ZHANG Haibo,SHE Lijia,XU Hui,XU Xin(259)	
Study on Visual Localization Technology for Aerial Refueling.....	
.....ZHAO Minkun,LIU Xiaoxiong,XU Xinlong,YANG Nan,WANG Yinglong(267)	
Target Attacking Intention Identification of AdaMod Optimization Model Based on Deep Neural Network.....	
.....WANG Jiabin,WANG Ruiqi,MENG Haibo,LIN Hongming,CHEN Tianqun(274)	
Network Information Encryption Based on One-Dimensional Logistic Mapping and Two-Dimensional Tent Mapping	
.....TIAN Ruyi,GU Fengjun,PENG Kun,GUO Xu(280)	
Design and Characteristic Analysis of Multi-channel Initiation Circuit.....	
.....WANG Yi,LIU Zesheng,ZHAO Xurui,QIN Dongze(287)	

● Test & Evaluation Technology ●

Verification Platform of Systolic Array Module Based on DPI-C.....	
.....WANG Xin,CHEN Bo(293)	
Research on Evaluation Method for In-Service Inspection of Space Equipment.....	
.....YANG Ping,QIN Liuyang,HAN Huijie(299)	
Design of Aircraft Engine PHM Simulation and Verification Platform Based on Knowledge Graph.....	
.....FAN Manyi,LUO Kai,MA Yingjie,HAN Chongpeng(305)	

计算机测量与控制

Jisuanji Celiang Yü Kongzhi

2023年 第31卷 第6期 (总第297期)

月刊 公开发行人 1993年创刊

Computer Measurement & Control Vol.31 No.6

Jun. 2023 (Series 297) 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 王小龙 支超有 方华亮 凤雷 付平
叶廷东 兰智高 任祥顺 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 李凯 李祺 李旗挺 许亮 张友鹏 张航瑛 张新星 何怡刚 肖明清 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 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.jsjcykz.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6月25日

责任编辑: 任旺芳

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 / Jun, 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

06