

# 目 次

## • 综述与评论 •

低温火箭自主故障诊断和发射控制.....张青松,刘巧珍,王晓林,宋征宇(1)

## • 测试与故障诊断 •

运载火箭推进剂温度地面高精度测量系统设计.....梁艳迁,梁建国,张众,陈超,古艳峰,朱亮聪(10)

基于EtherCAT和LabVIEW的风洞安全联锁及状态监测系统设计.....邓章林,贾霜,阎成(14)

民机故障预测与健康管理系统顶层架构设计技术研究.....谢娜,雷江妮(19)

基于云平台的蒸渗仪远程故障诊断方法研究.....田野,闫茂德,杨盼盼,朱旭(23)

基于无线传输的机轮胎压测试系统的设计.....朱洪翔,董青,闫利军(28)

基于改进ARMA模型的火箭发动机稳态工况过程实时故障诊断方法研究.....邓晨,薛薇,郑孟伟,马菡(33)

电力计量装置电压异常状态检测系统设计.....姜思卓,程超,王强(39)

基于FE-SEA混合法的机舱内中频噪声预测技术.....刘飞,白静,刘小群(43)

基于高频开关网络的自动测试系统的设计与实现.....李泽明,王鹤,胡顺平,李明军(48)

基于遗传算法的机械设备故障检测机器人设计.....周伟恒(53)

基于Adam-BNDNN的网络入侵检测模型.....何梦乙,覃仁超,刘建兰,熊健,唐风扬(58)

基于混合高斯模型的跑道侵入检测方法.....潘卫军,吴郑源,陈佳炀,邵楚涵(63)

## • 控制技术 •

探月卫星在备份航天器遥控上的设计与验证.....李晓光,沈小虎,杨眉,刘适(68)

非理想反电动势无刷直流电机Simulink仿真.....吴铎,方伟,叶新,杨东军(71)

超导镀膜测量装置远控系统研究.....李爱玲,赵伟华,郑健,彭朝华,周立鹏(77)

汽车驾驶模拟器控制系统的设计与实现.....宋晓妍,王群淞,刘晶郁,杨炜(82)

雷达稳定平台模糊PID串级控制设计与仿真.....梅栋,俞竹青(88)

基于自适应模糊控制的混凝土配料系统研究与应用.....何小宁,肖伸平,李浩,黄云章(93)

基于期望系统的PID频域逼近设计.....杨启文,张孜文,曾韵之,薛云灿(97)

桥架起重机防晃控制非线性系统建模与研究.....杨立颖(103)

基于LabVIEW的直驱式液压调平系统设计.....杨海清,钟家硕(108)

基于TdPN的中小流量交叉口信号控制研究.....宋佳运(112)

基于ZigBee的蔬菜大棚自动灌溉系统设计.....杨帆,黄吴漾(117)

基于阻尼多级分段调节的半主动悬架系统.....解雅雯(122)

## • 测试软件工程 •

基于MFC的航空电子系统综合自动检测设备客户端软件设计与实现.....王凯,陈德军,范光华,宋帆(126)

## • 设计与应用 •

- 联合同步挤压小波变换和多尺度排列熵的局部放电类型识别.....马晓燕,王文波(131)
- 机电综合技术在无人机液冷系统中的应用.....艾素霄,梁世哲,任杰,晏涛(136)
- 小型遥测数据采集存储装置设计.....刘倩,李雷,张永杰,李芳培(140)
- 基于改进粒子群算法的UAV航迹规划方法.....熊华捷,蔚保国,何成龙(144)
- 基于OpenDDS和反射内存卡的信息分发技术.....刘爽,侯正平,宋雷军,申臻(148)
- 三菱Q系列PLC串口自由通讯方法的探究.....范蟠果,王超然,张红伟,刘经纬(153)
- 基于LSTM的辅助动力装置系统辨识与仿真.....杜维仲,王硕(157)
- S4000P规范下装备预防性维修分析方法的研究.....王南松,王凌(162)
- 基于多阵元的室内导航伪卫星系统设计.....程建强,李隽,甘兴利,史宝玲(169)
- 结合LBP特征和深度学习的人脸表情识别.....张广世,葛广英,朱荣华,孙群(174)
- 基于FCA-ReliefF的融合生理信号情绪识别研究.....潘礼正,尹泽明,余世刚,袁峥峥,赵路(179)
- 双目视觉机器人遮挡目标识别研究.....曾维阳,戴圣伟,张卓钧(184)
- 基于改进遗传算法的摄像机自标定方法.....杨亚男,贾渊(188)
- 柴油发电机数字电压调节技术研究.....吕沁,付大丰,杨善水,祁在明,王立坤(192)
- 改进鲸鱼算法构建混合模型的建筑能耗预测.....王茹,宋爽,贺佳(197)
- 智能科技查新系统的设计与实现.....黄孝伦,王东,谭涛,刘芹(202)
- 基于eFPGA的通信基带加速器的逻辑重构设计.....刘朋,李斌,常迎辉,郝亚男,赵月明(206)
- 风洞通用压力扫描阀综合数据采集系统的设计与实现.....曾星,顾光武,张文清,顾正华,杨兆欣(211)
- 基于Three.js的飞行仿真系统设计.....冯姣,刘志勤,黄俊,黎茂锋,杨茂(216)
- 基于Kalman滤波的车位侧方距离修正方法.....杨述斌,蒋宗霖,刘寒(220)
- 多通道混合数据采集系统设计及实现.....严博(224)
- 混合动力电动汽车中利用决策树CART算法的能源管理方案.....徐燕(229)
- 基于头戴式双目相机的智能变电站巡检巡视系统设计.....刘广振,张黎明,吴东,王磊(235)
- 基于物联网的智能室内定位送水系统设计.....胡琦瑶,周和兴,彭先霖,艾娜,齐锦(240)
- 基于高分遥感影像的断裂道路连接方法.....沈川,贾渊,杨珂珂(246)
- 基于PageRank的网络布局算法.....李冉,吴亚东,王松,陈华容,廖竞(250)

## • 试验与评价技术 •

- 合成旅战时装备维修保障效能评估指标研究.....谷亚辉,程中华,白旭华(258)
- 新型落锤冲击试验系统研制.....江磊,吴乙万,白鸿柏,李上洲,任志英(262)
- 基于逻辑框图的卫星健康评估方法.....朱昶文,党建成,张明良,张发家,庄建昆(267)

# Contents

## • Summary and Comment •

Autonomous Fault Diagnosis and Pre-launch Control for Cryogenic Rocket.....	
.....Zhang Qingsong,Liu Qiaozhen,Wang Xiaolin,Song Zhengyu(1)	

## • Test and Fault Diagnosis •

Design of Launch Vehicle Propellant Temperature High-precision Measurement System.....	
.....Liang Yanqian,Liang Jianguo,Zhang Zhong,Chen Chao,Gu Yanfeng,Zhu Liangcong(10)	
Design of Safety Interlocking and State Monitoring System Based on EtherCAT and LabVIEW.....	
.....Deng Zhanglin,Jia Shuang,Yan Cheng(14)	
A Technical Research of Prognostics and Health Management Architecture on Civil Aircraft.....	
.....Xie Na,Lei Jiangni(19)	
Remote Fault Diagnosis Method for Lysimeters Based on Cloud Platform.....	
.....Tian Ye,Yan Maode,Yang Panpan,Zhu Xu(23)	
Design of Tire Pressure Test System Based on Wireless Transmission.....	
.....Zhu Hongxiang,Dong Qing,Yan Lijun(28)	
Study on Real-Time Diagnosis Method of the Main Stage Working Condition of Rocket Engine Based on Improved ARMA Model.....	
.....Deng Chen,Xue Wei,Zheng Mengwei,Ma Han(33)	
Design of Voltage Abnormal State Detection System for Power Metering Device.....	
.....Jiang Sizhuo,Cheng Chao,Wang Qiang(39)	
Prediction Technology of Medium Frequency Noise in Engine Room Based on FE-SEA Hybrid Method.....	
.....Liu Fei,Bai Jing,Liu Xiaoqun(43)	
Design and Implementation of Automatic Test System Based on High Frequency Switching Network.....	
.....Li Zeming,Wang He,Hu Shunping,Li Mingjun(48)	
Design of Fault Detection Robot for Mechanical Equipment Based on Genetic Algorithm.....	
.....Zhou Weiheng(53)	
Network intrusion Detection Model Based on Adam-BNDNN.....	
.....He Mengyi,Qin Renchao,Liu Jianlan,Xiong Jian,Tang Fengyang(58)	
Runway Intrusion Detection Method Based on Gaussian Mixture Model.....	
.....Pan Weijun,Wu Zhengyuan,Chen Jiayang,Shao Chuhan(63)	

## • Control Technology •

Analysis and Practice of Backup Spacecraft Tele Command Based on Lunar Exploration Spacecraft.....	
.....Li Xiaoguang,Shen Xiaohu,Yang Mei,Liu Shi(68)	
Simulation Research on Non-ideal Back-EMF BLDCM Based on Simulink.....	
.....Wu Duo,Fang Wei,Ye Xin,Yang Dongjun(71)	
Study of Remote Control System for Superconducting Coating Measuring Device.....	
.....Li Ailing,Zhao Weihua,Zheng Jian,Peng Zhaohua,Zhou Lipeng(77)	
Design and Implementation of Car Driving Simulator Control System.....	
.....Song Xiaoyan,Wang Qunsong,Liu Jingyu,Yang Wei(82)	
Design and Simulation of Fuzzy PID Cascade Control for Radar Stabilization Platform.....	
.....Mei Dong,Yu Zhuqing(88)	
Research and Application of Concrete Batching System Based on Adaptive Fuzzy Control.....	
.....He Xiaoning,Xiao Shenping,Li Hao,Huang Yunzhang(93)	
Desired System Based Approximation in Frequency Domain for PID Design.....	
.....Yang Qiwen,Zhang Ziwen,Zeng Yunzhi,Xue Yuncan(97)	
Modeling and Research on Nonlinear System of Overhead Crane Anti-sway Control.....	
.....Yang Liying(103)	
Design of Direct Drive Hydraulic Leveling System Based on LabVIEW.....	
.....Yang Haiqing,Zhong Jiashuo(108)	
Signal Control of Small and Medium Flow Intersection Based on Timed Petri Net.....	
.....Song Jiayun(112)	
Design of Greenhouse Automatic Irrigation System Based on ZigBee.....	
.....Yang Fan,Huang Wuyang(117)	
A Semi-active Suspension System Based on Damping Multi-stage Subsection Regulation.....	
.....XieYawen(122)	

## • Test Software Engineering •

Design and Implementation of Client Software for Integrated Automatic Test Equipment Software of Avionics System Based on MFC..... Wang Kai, Chen Dejun, Fan Guanghua, Song Fan(126)

## • Design and Application •

Partial Discharge Recognition Based on Synchrosqueezing Wavelet Transform and Multi-scale Permutation Entropy..... Ma Xiaoyan, Wang Wenbo(131)

Application of Electro-Mechanical Integration Technology in UAV Liquid-Cooling System..... Ai Suxiao, Liang Shizhe, Ren Jie, Yan Tao(136)

Design of Small Telemetry Data Acquisition and Storage Device..... Liu Qian, Li Lei, Zhang Yongjie, Li Fangpei(140)

UAV Path Planning Method Based on Improved PSO..... Xiong Huajie, Yu Baoguo, He Chenglong(144)

Information Distribution Technology Based on OpenDDS and Reflective Memory..... Liu Shuang, Hou Zhengping, Song Leijun, Shen Zhen(148)

Research on Mitsubishi Q Series PLC Serial Port Free Communication Method..... Fan Panguo, Wang Chaoran, Zhang Hongwei, Liu Jingwei(153)

System Identification and Simulation of Auxiliary Power Plant Based on LSTM..... Du Weizhong, Wang Shuo(157)

Study on Equipment Preventive Maintenance Analysis Method Based on S4000P Specification..... Wang Nansong, Wang Ling(162)

Design of Indoor Navigation Pseudo Satellite System Based on Multi-Array..... Cheng Jianqiang, Li Jun, Gan Xingli, Shi Baoling(169)

Facial Expression Recognition Based on LBP Features and Deep Learning..... Zhang Guangshi, Ge Guangying, Zhu Ronghua, Sun Qun(174)

Emotion Recognition Based on Physiological Signal Fusion and FCA-Relief..... Pan Lizheng, Yin Zeming, She Shigang, Yuan Zhengzheng, Zhao Lu(179)

Research on Recognition of Occluded Target for Binocular Vision Robot..... Zeng Weiyang, Dai Shengwei, Zhang Zhuojun(184)

Camera Self-calibration Method Based on Improved Genetic Algorithm..... Yang Yanan, Jia Yuan(188)

Research on Digital Voltage Regulation Technology of Diesel Generator..... Lv qin, Fu Dafeng, Yang Shanshui, Qi Zaiming, Wang Likun(192)

Building Energy Consumption Prediction Based on Hybrid Model Constructed by Improved Whale Algorithms..... Wang Ru, Song Shuang, He Jia(197)

Construction of Intelligent Novelty Search System..... Huang Xiaolun, Wang Dong, Tan Tao, Liu Qin(202)

Logic Reconfiguration Design of Communication Baseband Accelerator Based on eFPGA..... Liu Peng, Li Bin, Chang Yinghui, Hao Yanan, Zhao Yueming(206)

Design and Implementation of Comprehensive Data Acquisition System for Wind Tunnel Common Pressure Scanner..... Zeng Xing, Gu Guangwu, Zhang Wenqing, Gu Zhenghua, Yang Zhaoxin(211)

Design of Flight Simulation System Based on Three.js..... Feng Jiao, Liu Zhiqin, Huang Jun, Li Maofeng, Yang Mao(216)

Vehicle Side Distance Correction Method Based on Kalman Filter..... Yang Shubin, Jiang Zonglin, Liu Han(220)

Design and Implementation of Multi-channel Hybrid Data Acquisition System..... Yan Bo(224)

A Power Management Strategy Using Decision Tree CART Algorithm for Diesel Hybrid Electric Vehicle..... Xu Yan(229)

Design of Intelligent Substation Patrol Inspection System Based on Head Mounted Binocular Camera..... Liu Guangzhen, Zhang Liming, Wu Dong, Wang Lei(235)

Design of Intelligent Indoor Positioning Water Supply System Based on Internet of Things..... Hu Qiyao, Zhou Hexing, Peng Xianlin, Ai Na, Qi Jin(240)

Fracture Road Connection Method Based on High Score Remote Sensing Image..... Shen Chuan, Jia Yuan, Yang Keke(246)

A PageRank-based Network Layout Algorithm..... Li Ran, Wu Yadong, Wang Song, Chen Huarong, Liao Jing(250)

## • Test & Evaluation Technology •

Study on Evaluation Index of Synthetic Brigades Wartime Equipment Maintenance Support Effectiveness..... Gu Yahui, Cheng Zhonghua, Bai Xuhua(258)

Development of a New Drop Hammer Test System..... Jiang Lei, Wu Yiwan, Bai Hongbai, Li Shangzhou, Ren Zhiying(262)

Satellite Health Assessment Method Based on Logic Block Diagram..... Zhu Changwen, Dang Jianchen, Zhang Mintgliang, Zhang Fajia, Zhuang Jiankun(267)