

# 目 次

## • 综述与评论 •

无人机故障预测与健康管理研究现状及发展 ..... 罗晓亮, 涂 龙, 王浩旭, 王晓晶, 胡振峰, 喻凡坤, 梁秀兵 (1)

## • 测试与故障诊断 •

- C波段基站式多目标遥测网络构建技术 ..... 霍朝晖, 惠 力 (6)  
水电厂励磁系统故障分析及改进措施研究 ..... 李大焱 (10)  
S/X/Ka频段卫星地面站无人机测试标校设计 ..... 解玲娜, 王 怀 (14)  
轨道交通供电系统电缆故障在线定位技术研究 ..... 马一博, 石 勇 (20)  
基于多元状态感知监测技术的快速灭弧开关故障在线监测 ..... 曹海欧, 孟屹华, 黄 翔, 崔 玉, 潘 琪 (24)  
基于Zoom-FFT技术的铁路移频信号检测系统设计 ..... 李永岩 (29)  
基于FPGA的便携式VI曲线航空电路板测试装置 ..... 袁 荣, 张子明, 李金猛, 刘良勇, 周勇军 (34)  
基于数字孪生的智能车间系统仿真加速测试方法 ..... 成克强, 林家全, 杨东裕, 戴青云, 王美林 (39)  
基于三点重合算法的飞机活动面转角测量研究 ..... 段曙凯, 李徐辉, 吴 熙, 潘智昊 (45)  
数据驱动的飞行器智能故障诊断系统研究 ..... 李 智, 姜 悅, 蔡斐华, 褚厚斌, 张丽晔 (50)  
基于ARM和WIFI技术的心电信号实时检测系统设计与研究 ..... 张 昊, 孙 元, 王志刚, 王换换 (54)  
基于GMR传感器的金属表面缺陷检测系统设计 ..... 李 超, 张志杰, 韩 宁, 赵晨阳 (59)

## • 控制技术 •

- 引射式跨声速风洞流场控制软件设计 ..... 韩逸非, 冯娜娜 (66)  
4WD-4WS型床椅一体化机器人室内定位与点镇定控制研究 ..... 李秀智, 杨 宇, 贾 桐, 张祥银 (71)  
基于矢量控制的永磁同步电机控制方法研究 ..... 张会娟, 姚艳艳, 刘建娟, 吴才章, 陈红梅 (77)  
航天器在轨基线控制系统设计与实现 ..... 储海洋 (82)  
基于模糊RBF神经网络算法的灌溉控制系统设计 ..... 张丽娜, 鲁旭涛, 刘 昊, 李 静 (87)  
面向工业4.0的多维视频监控系统设计 ..... 韩亚辉 (93)  
基于FDRE的节水灌溉智能控制系统的研究与设计 ..... 孙思敏, 董宇欣, 吕 杨 (97)  
基于MOS管的箭载时序控制器设计与实现 ..... 江良伟, 季海波 (102)  
星地测控链路中的功率控制策略研究 ..... 朱智宇, 孙林歌, 汪筱阳, 朱 琳, 田雨雷, 刘 伟, 陈 涛 (106)  
基于力阻抗模型的上肢康复机器人交互控制系统设计 ..... 程 帆, 董宇欣 (111)  
面向同步发电机励磁控制交流采集系统的设计 ..... 王 靖, 宋晓茹, 高 嵩, 王 坤 (115)  
高速列车多目标约束横向半主动控制算法研究 ..... 陈春俊, 陈仁涛 (120)

## • 军事装备测控技术 •

- 基于流向图的不完备信息下导弹故障诊断知识获取 ..... 刘兆政, 肖明清, 胡阳光, 李剑峰, 王俊东 (126)  
某型舰载雷达气象通道检测系统设计 ..... 张波, 陈岩申, 张坚, 王新洲 (130)

## • 测试软件工程 •

- 基于NI-VISA的晶圆测试探针台远程控制软件的设计与实现 ..... 杜开元, 袁俊, 卢旭坤 (135)

## • 设计与应用 •

- 基于BIM+Cesium三维可视化校园系统的设计与实现 ..... 叶娜, 严昱欣, 张翔, 董丽丽 (140)  
一种融合模拟退火和单亲遗传的优化求解算法 ..... 王海红, 李林, 刘莉 (146)  
基于DNN与规则学习的机器翻译算法研究 ..... 陶媛媛, 陶丹 (150)  
基于GIS的短时交通客流智能协调控制系统设计 ..... 王伟, 李琰 (154)  
基于IETM的运载火箭电气试验信息管理系统设计 ..... 王丹, 黄皓, 陈策, 尹禄高 (159)  
风洞动力资源系统集成化保障研究 ..... 郑娟, 罗昌俊, 马永一, 王小飞, 高虎 (163)  
容器云中基于改进遗传算法的资源分配策略 ..... 张松霖 (168)  
基于模型的四旋翼无人机半实物仿真平台研究 ..... 袁源 (174)  
基于图像分割的无人机遥感影像目标提取技术 ..... 赵一粟 (179)  
基于元胞遗传算法的机器人路径规划研究 ..... 李昌华, 石如雪, 李智杰, 张颉 (184)  
基于遗传算法和非线性规划求解信息交互的光伏阵列模型鲁棒参数辨识方法 .....  
..... 郑银燕, 胡桂廷, 张正江, 闫正兵, 朱志亮 (189)  
基于句子级上下文内容的神经机器翻译方法 ..... 杨娇 (194)  
基于语义分割和空间上下文信息的防震锤识别 ..... 贾立业, 韩军, 余鸿飞 (200)  
一种全自动除雪机器人设计 ..... 何龙, 潘江如, 张成, 甄世婵, 李潇 (206)  
机器学习在卫星遥测分析建模中的应用 ..... 王旭, 都晓辉, 陈昌麟, 付宇, 杨涛 (210)  
基于嵌入式的空间光通信系统前馈补偿系统设计 ..... 刘晓兴 (215)  
探索功能性脑网络差异的可视分析系统设计与实现 ..... 张振兴, 吴亚东, 廖竞, 王娇 (220)  
基于无线宽带的林业监控网络架构设计 ..... 林海, 沈敦亮, 汪东洋, 邵超, 张子剑 (227)  
基于小波变换的抑制复位噪声技术研究 ..... 潘良, 张天瑶, 梁铭珊, 邓盼盼 (231)

## • 试验与评价技术 •

- 基于代理的航天器自主运行仿真系统设计与验证 ..... 范延芳, 李瑞军, 周晓伶, 成宏璟 (236)  
基于图像分析的粘接质量评价系统设计 ..... 王新德, 王文强, 钟峰 (240)

## • 智能仪器与传感技术 •

- 基于MAX10的多通道小型化记录仪设计 ..... 朱志斌, 马游春, 鲍爱达 (246)

# Contents

## ● Summary and Comment ●

Research on Status and Development Trend of Prognostics and Health Management for Military Unmanned Aerial Vehicles.....Luo Xiaoliang,Tu Long,Wang Haoxu,Wang Xiaojing,Hu Zhenfeng,Yu Fankun,Liang Xiubing(1)

## ● Test and Fault Diagnosis ●

Construction Technology of C-band Base Station Multi-target Telemetry Network.....Huo Zhaohui,Xi Li(6)  
Fault Analysis and Improvement of Excitation System in Hydropower Plant.....Li Dayan(10)  
S/X/Ka Band Satellite Ground Station UAV Test Calibration Design.....Xie Lingna,Wang Huai(14)  
Research on On-line Cable Fault Location Technology of Rail Transit Power Supply System.....Ma Yibo,Shi Yong(20)  
On Line Fault Monitoring of Fast Arc Extinguishing Switch Based on Multi State Perception Monitoring Technology  
.....Cao Haiou,Meng Yihua,Huang Xiang,Cui Yu,Pan Qi(24)  
Design of Railway Frequency Shift Signal Detection System Based on Zoom-FFT Technology.....Li Yongyan(29)  
Portable Aviation Circuit Board Test Device of VI Curve Based on FPGA.....  
.....Yuan Rong,Zhang Ziming,Li Jinmeng,Liu Liangyong,Zhou Yongjun(34)  
Simulated Acceleration Testing of Intelligent Workshop System Based on Digital Twin.....  
.....Cheng Keqiang,Lin Jiaquan,Yang Dongyu,Dai Qingyun,Wang Meilin(39)  
Measurement of Airplane Surface Rotation Angle Based on Coincide Algorithm with Three Points.....  
.....Duan Shukai,Li Xuhui,Wu Xi,Pan Zhihao(45)  
Study on a Data-driven Intelligent Fault Diagnosis System of Spacecraft.....  
.....Li Zhi,Jiang Yue,Cai Feihua,Chu Houbin,Zhang Liye(50)  
Design and Research of ECG Signal Real-time Acquisition System Based on ARM and WIFI Technology.....  
.....Zhang Hao,Sun Yuan,Wang Zhigang,Wang Huanhuan(54)  
Design of Metal Surface Defect Detection System Based on GMR Sensor.....  
.....Li Chao,Zhang Zhiping,Han Ning,Zhao Chenyang(59)

## ● Control Technology ●

Design of Flow Field Control Software for Ejecting Transonic Wind Tunnel.....Han Yifei,Feng Nana(66)  
Research on Indoor Positioning and Point Stabilization Control of 4WD-4WS Wheelchair-Bed Robot.....  
.....Li Xiuzhi,Yang Yu,Jia Tong,Zhang Xiangyin(71)  
Research on Method of PMSM Based on Vector Control.....  
.....Zhang Huijuan,Yao Yanyan,Liu Jianjuan,Wu Caizhang,Chen Hongmei(77)  
Design and Implementation of State Baseline Control System for On-orbit Spacecraft.....Chu Haiyang(82)  
Design of Irrigation Control System Based on Fuzzy RBF Neural Network Algorithm.....  
.....Zhang Lina,Lu Xutao,Liu Hao,Li Jing(87)  
Design of Multidimensional Video Monitoring System for Industry 4.0.....Han Yahui(93)  
Research and Design of Water Saving Irrigation Intelligent Control System Based on FDRE.....  
.....Sun Simin,Dong Yuxin,Lü Yang(97)  
Design and Implementation of Time Serier Controller for Launch Vehicle Based on MOSFET.....  
.....Jiang Liangwei,Ji Haibo(102)  
Research on Power Control Strategy in TT&C Link Between Satellite and Ground.....  
.....Zhu Zhiyu,Sun Linge,Wang Xiaoyang,Zhu Lin,Tian Yulei,Liu Wei,Chen Tao(106)  
Design of Interactive Control System for Upper Limb Rehabilitation Robot Based on Force Impedance Model.....  
.....Cheng Fan,Dong Yuxin(111)  
Design of AC Acquisition System for Excitation Control of Synchronous Generator.....  
.....Wang Jing,Song Xiaoru,Gao Song,Wang Kun(115)  
Research on Multi-objective Constrained Transverse Semi-active Control Algorithm for High-speed Trains.....  
.....Chen Chunjun,Chen Rentao(120)

## ● Military Equipment Technology in Measurement and Control ●

Acquisition of Missile Fault Diagnosis Knowledge Based on Incomplete Information of Flow Graph.....  
.....Liu Zhaozheng,Xiao Mingqing,Hu Yangguang,Li Jianfeng,Wang Jundong(126)

Development of Test System for Meteorological Channel of Shipborne Radar.....	Zhang Bo,Chen Yanshen,Zhang Jian,Wang Xinzhou(130)
---	--

### ● Test Software Engineering ●

Design and Implementation of Remote Control Software for Wafer-Test Prober Equipment Based on NI-VISA.....	Du Kaiyuan,Yuan Jun,Lu Xukun(135)
--	-----------------------------------

### ● Design and Application ●

Design and Implementation of Three-dimensional Visual Campus System Based on BIM + Cesium.....	Ye Na,Yan Yuxin,Zhang Xiang,Dong Lili(140)
--	--

An Optimal Solution Algorithm Combining Simulated Annealing and Single Parent Genetic.....	Wang Haihong,Li Lin,Liu Li(146)
--	---------------------------------

Research on Machine Translation Algorithm Based on DNN and Rule Learning.....	Tao Yuanyuan,Tao Dan(150)
---	---------------------------

Design of Intelligent Coordinated Control System of Short-term Traffic Passenger Flow Based on GIS.....	Wang Wei,Li Yan(154)
---	----------------------

Design of Launch Vehicle Electric Experiments Information System Based on IETM.....	Wang Dan,Huang Hao,Cheng Ce,Yin Lugao(159)
---	--

Research on Integrated Support Information System of Wind Tunnel Power Resources Supply System.....	Zheng Juan,Luo Changjun,Ma Yongyi,Wang Xiaofei,Gao Hu(163)
---	--

An Improved Genetic Algorithm for Resource Allocation in Container Clouds.....	Zhang Songlin(168)
--	--------------------

Research on Semi-Physical Simulation Platform of QUAV with Model-Based Design.....	Yuan Yuan(174)
--	----------------

Target Extraction Technology of Uav Remote Sensing Image Based on Image Segmentation.....	Zhao Yisu(179)
---	----------------

Research on Path Planning Based on Cellular Genetic Algorithm.....	Li Changhua,Shi Ruxue,Li Zhijie,Zhang Jie(184)
--	--

Robust Parameter Identification of Photovoltaic Arrays Model Based on Genetic Algorithm and Nonlinear Programming	Zheng Yinyan,Hu Guiting,Zhang Zhengjiang,Yan Zhengbing,Zhu Zhiliang(189)
---	--

Neural Machine Translation Method Based on Sentence-level Contextual Content.....	Yang Jiao(194)
---	----------------

Shock Hammer Recognition Based on Semantic Segmentation and Spatial Context Information.....	Jia Liye,Han Jun,Yu Hongfei(200)
--	----------------------------------

A Model Design of a New Automatic Snow Sweeping Robot.....	He Long,Pan Jiangru,Zhang Cheng,Zhen Shichan,Li Xiao(206)
--	---

Application of Machine Learning in Satellite Telemetry Data Analysis and Modeling.....	Wang Xu,Du Xiaohui,Chen Changlin,Fu Yu,Yang Tao(210)
--	--

Design of Feedforward Compensation System Based on Embedded Space Optical Communication System.....	Liu Xiaoxing(215)
---	-------------------

Design and Implementation of Visual Analysis System for Exploring the Difference of Functional Brain Network.....	Zhang Zhenxing,Wu Yadong,Liao Jing,Wang jiao(220)
---	---

Design of Forestry Monitoring Network Architecture Based on Wireless Broadband.....	Lin Hai,Shen Dunliang,Wang Dongyang,Shao Chao,Zhang Zijian(227)
---	---

Research on the reset noise suppressed Based on Wavelet Transform.....	Pan Liang,Zhang Tianyao,Liang Mingshan,Deng Panpan(231)
--	---

### ● Test & Evaluation Technology ●

Agent-based Spacecraft Autonomous Health Fault Simulation System Design and Verification.....	Fan Yanfang,Li Ruijun,Zhou Xiaoling,Cheng Hongjing(236)
---	---

Design of Bonding Quality Evaluation System Based on Image Analysis Technology.....	Wang Xinde,Wang Wenqiang,Zhong Feng(240)
---	--

### ● Intelligent Instruments and Sensing Technology ●

Design of Multichannel Minimized Recorder Based on MAX10.....	Zhu Zhibin,Ma Youchun,Bao Aida(246)
---	-------------------------------------