

仪器仪表学报
YIQI YIBIAO XUEBAO
第 44 卷 第 1 期 2023 年 1 月
目 次

传感器技术

硅微谐振式加速度计温度补偿方法研究综述	蒋金玲	张 晶	朱欣华	苏 岩	周 同(1)
镓基液态金属柔性应变传感器的设计优化与实验验证	孙 英	汪忠晟	韩智昊	刘卫朋(16)	
基于压电纤维传感器应力波方向检测的结构冲击定位研究	蒋 帅	沈意平	王送来	支余林	宾光富(27)
光纤传感微创手术探针末端三维力测量方法	于昌新	何彦霖	祝连庆	周康鹏	祝航威(38)
基于刚度轴偏角预估机制的 MEMS 多环谐振陀螺全闭环控制方法				周 同	余卓林(46)

信息处理技术

变分模式分解方法研究与应用综述	江星星	宋秋昱	杜贵府	黄伟国	朱忠奎(55)
基于递归量化观测的复合材料损伤贝叶斯估计方法	刘小峰	张春兵	柏 林	陈兵奎(74)	
一种低复杂度快速收敛的窄带主动噪声控制系统			祝文昭	罗 磊	张 夏(85)
基于改进多路径匹配追踪的芯片超声信号去噪方法	李 可	王 翊	明雪飞	顾杰斐	宿 磊(93)

先进感知与损伤评估

基于多翼型特征的非奇异变形感知方法研究	陈康宇	保 宏	贺大航	陈光达	冷国俊(101)
边缘计算生成式对抗网络差分进化滚动轴承特征识别方法			张效天	王 雪	强振峰(112)
基于时频特征融合与 GWO-ELM 的棒控电源早期故障状态辨识方法			唐圣学	马晨阳	勾 泽(121)
机电系统健康状态预测和维修决策的双向优化方法	梁思远	周金洽	高占宝	于劲松	宋 悅
基于时域模型相对熵的塔架结构非线性损伤检测研究				张 健(131)	
基于地电流的重力流排水管道泄漏检测	杨东馥	封 翰	齐敦哲	杜立普	沙 洲(154)

生物信息检测

低分辨率红外感知系统的人体行为数据增强	高闻需	杨 波	闵琳孜(163)
自适应跑步机人机跳跃交互稳定性分析与控制	钱宇阳	杨开明	朱 煜(172)
阿尔茨海默病多病程自适应筛查模型的构建	李志刚	胡德安	纪 勇
基于神经网络的足踝外固定矫形方案设计方法	葛韵斐	张 氵	徐立伟
基于深度测量的行人体态特征提取与再识别方法			沈义东
			孙远韬(190)
			刘明洋
			万九卿(201)

检测技术

融合注意力和多尺度特征的典型水面小目标检测	童小钟	魏俊宇	苏绍璟	孙 备	左 震(212)
激光超声信号变分模态分解与裂纹定量检测	颜江涛	赵纪元	訾艳阳	王琛玮(223)	
基于时空局部学习的集成自适应软测量方法	黄 成	金怀平	王 彬	钱 斌	
气泡影响下的电磁流量测量优化技术研究	葛 亮	袁一萍	白 洋	杨 彪(231)	
			曾 文	阳彩霞(242)	

智能系统与人工智能

基于力估计与切换控制的六足机器人三边遥操作	李佳钰	黄启霖	尤 波	张喜洋	丁 亮(253)
基于狄利克雷过程聚类的机器人演示学习研究	吴晓敏	贺 苗	刘暾东	张馨月	邵桂芳(265)
面向人机协作系统的上肢姿态精准识别算法研究	张 塑	刘志诚	刘纪元	华 亮	费敏锐(275)
融合机器视觉与邻近度估计的相似工业设备识别策略研究	徐哲壮	黄 平	陈 丹	吴开田	李建坤(283)

CHINESE JOURNAL OF SCIENTIFIC INSTRUMENT

VOLUME 44 NUMBER 1 JANUARY 2023

CONTENTS

Sensor Technology

- Review of temperature compensation methods for silicon micro-resonant accelerometers Jiang Jinling, Zhang Jing, Zhu Xinhua, Su Yan, Zhou Tong(1)
Design optimization and experimental validation of the gallium-based liquid metal flexible strain sensor Sun Ying, Wang Zhongsheng, Han Zhihao, Liu Weipeng(16)
Research on structural impact source location based on sensing of stress wave direction by the piezoelectric fiber sensor Jiang Shuai, Shen Yiping, Wang Songlai, Zhi Yulin, Bin Guangfu(27)
Three-dimensional end-force measurement method of optic fiber sensing minimally invasive surgical probe Yu Changxin, He Yanlin, Zhu Lianqing, Zhou Kangpeng, Zhu Hangwei(38)
Full-closed loop control method of MEMS disk resonant gyroscope based on the stiffness axis declination angle prediction mechanism Zhou Tong, Yu Zhuolin(46)

Information Processing Technology

- Review on research and application of variational mode decomposition Jiang Xingxing, Song Qiuyu, Du Guiyu, Huang Weiguo, Zhu Zhongkui(55)
Bayesian estimation of composite structure damage based on recursive quantitative observation Liu Xiaofeng, Zhang Chunbing, Bo Lin, Chen Bingkui(74)
Novel low-complexity and fast-convergence narrowband active noise control system Zhu Wenzhao, Luo Lei, Zhang Xia(85)
Denoising method of chip ultrasonic detection signals based on the improved multipath matching pursuit Li Ke, Wang Chong, Ming Xuefei, Gu Jiefei, Su Lei(93)

Advanced Sensing and Damage Assessment

- Research on the non-singular shape sensing method based on multi-airfoil features Chen Kangyu, Bao Hong, He Dahang, Chen Guangda, Leng Guojun(101)
An edge computing method for differential evolution of generative adversarial networks rolling bearing feature recognition Zhang Xiaotian, Wang Xue, Qiang Zhenfeng(112)
Early fault state identification method of the rod control system power equipment based on time-frequency characteristics fusion and GWO-ELM Tang Shengxue, Ma Chenyang, Gou Ze(121)
Bi-directional optimization method for health state prediction and maintenance decision-making of electromechanical systems Liang Siyuan, Zhou Jinhan, Gao Zhanbao, Yu Jinsong, Song Yue, Zhang Jian(131)
Research on nonlinear damage detection of tower structure based on relative entropy of the time domain model Guo Huiyong, Li Meng(143)
Leakage detection of gravity flow drainage pipeline based on geo-electrical current Yang Dongfu, Feng Hao, Qi Dunzhe, Du Lipu, Sha Zhou(154)

Bioinformation Detection

- Human behavior data augmentation for the low-resolution infrared perception system Gao Wenpei, Yang Bo, Min Linzi(163)
Stability analysis and control of the jumping interaction in self-paced treadmills Qian Yuyang, Yang Kaiming, Zhu Yu(172)
Construction of a multiple disease courses adaptive screening model for Alzheimer's disease Li Zhigang, Hu Dean, Ji Yong, Wu Hao, Shan Peng(182)
Research on foot and ankle deformity correction schemes with external fixator based on neural network Ge Yunfei, Zhang Qing, Xu Liwei, Shen Yidong, Sun Yuantao(190)

Detection Technology

- Typical small target detection on water surfaces fusing attention and multi-scale features Tong Xiaozhong, Wei Junyu, Su Shaojing, Sun Bei, Zuo Zhen(212)
Variational mode decomposition of laser ultrasonic signal and crack quantitative detection Yan Jiangtao, Zhao Jiyuan, Zi Yanyang, Wang Chenwei(223)
Ensemble adaptive soft sensor method based on spatio-temporal local learning Huang Cheng, Jin Huaiping, Wang Bin, Qian Bin, Yang Biao(231)
Research on optimization technology of electromagnetic flow measurement under the influence of air bubbles Ge Liang, Yuan Yiping, Bai Yang, Zeng Wen, Yang Caixia(242)

Intelligent System and Artificial Intelligence

- Trilateral teleoperation of hexapod robot based on force estimation and switching control Li Jiayu, Huang Qilin, You Bo, Zhang Xiyang, Ding Liang(253)
Study of robot demonstration learning based on the Dirichlet process clustering Wu Xiaomin, He Miao, Liu Tundong, Zhang Xinyue, Shao Guifang(265)
Research on the accurate recognition algorithm of upper limb posture for the human-manipulator cooperation system Zhang Kun, Liu Zhicheng, Liu Jiyuan, Hua Liang, Fei Minrui(275)
Research on similar industrial devices recognition strategy based on machine vision and proximity estimation Xu Zhezhuang, Huang Ping, Chen Dan, Wu Kaitian, Li Jiankun(283)