



ISSN 1001-0505  
CODEN DDXZB9

# 东南大学学报

(自然科学版)

JOURNAL OF SOUTHEAST UNIVERSITY

(NATURAL SCIENCE EDITION)

第43卷 第2期

Vol.43 No.2



中国 南京  
Nanjing, China

2

2013

## 目 次

基于相位差复指数变换的传声器多声源定位	赵小燕	汤 捷	周 琳	吴镇扬	(231)		
波形未知的水声脉冲信号双阵元相关匹配场定位	李 煄	方世良	安 良	方世良	(236)		
舰船辐射噪声的响度和音色特征模型			曹红丽	方世良	(241)		
基于一维 PCA-EIR 技术的二维 SVD-FIR 滤波器设计	王 浩	包永强	奚 吉	邹采荣	(247)		
基于 TDOA 的无线定位方法及其性能分析				史小红	(252)		
基于干扰保护的同信道干扰下 VHT WLANs 性能			冀保峰	杨绿溪	(258)		
面向低功耗的片上网络虚通道分配算法	周 芳	吴 宁	周 磊	张 颖	(263)		
极低电源电压和极低功耗的亚阈值 SRAM 存储单元设计	柏 娜	冯 越	尤肖虎	时龙兴	(268)		
低功耗 $0.18 \mu\text{m}$ 10 Gbit/s CMOS 1:4 分接器设计			潘 敏	冯 军	(274)		
使用定向天线的无线自组网中基于粒子群优化的最大生命期广播树构造算法			沈 军	朱晓建	(279)		
基于拓扑连通概率的车载自组织网络路由算法	陶 军	肖 鹏	刘 莹	陈文强	(286)		
基于量子云模型演化的最小属性约简增强算法	丁卫平	王建东	管致锦	施 俊	(290)		
基于压缩感知的云存储系统状态监测方法	冯 径	张梁梁	沈 畔	梁陆萍	(296)		
社交网络中基于用户投票的推荐机制			刘锡文	蒋俊杰	(301)		
基于 LSSVM 的开关磁阻电机转子位置估算	徐宇柘	曹彦萍	钟 锐	屈 严	彭富林	(307)	
基于 LSSVM-GPC 的流化床锅炉多变量协调控制方法	孙 立		潘 蕾	沈 炯	(312)		
轴向磁场无铁心永磁无刷直流电动机设计			曹永娟	黄允凯	金 龙	(317)	
基于混合型鲁棒输入训练神经网络的非线性数据校正方法及其应用			任少君	司凤琪	李欢欢	徐治皋	(322)
非连续运行工况下垂直地埋管换热器的换热特性			杨卫波		施明恒	陈振乾	(328)
基于线控技术的四轮转向全滑模控制			郑凯锋		陈思忠	王 亚	(334)
基于超弹性模型的牙周膜生物力学响应			黄辉祥	汤文成	吴 斌	严 斌	(340)
基于有限元分析的石墨烯弹性性能和振动特性			唐文来		彭倚天	倪中华	(345)
ZrC 基复合材料及微观结构分析			戎志丹		刘玉付	仲文静	(350)
环氧沥青混合料细观尺度水损坏特性				胡 靖		钱振东	(355)
混凝土裂缝的微生物自修复效果	钱春香	李瑞阳	潘庆峰	罗 勉	荣 辉	(360)	
不同污染条件下微生物矿化固结 $\text{Zn}^{2+}$ 的作用及机理	陆兆文	钱春香	许燕波	王明明	(365)		
水泥基材料微结构的反复压汞法表征	肖海军	孙 伟	蒋金洋	王彩辉	(371)		
地下水曝气空气流动形态影响因素数值模拟	刘志彬	陈志龙	杜延军	方 伟	(375)		
FISH 技术解析不同氨氮浓度 MBR 中的微生物群落结构							
	杨小丽	周 娜	陈 明	张 瑞	宋海亮	傅大放	(380)
改进 SBR 处理垃圾渗滤液深度脱氮的启动与实现	王 凯	王淑莹	朱如龙	苗 蕾	彭永臻	(386)	
新型开洞软钢板阻尼器的理论及试验研究			李宗京	黄 镇	李爱群	(392)	
用于黏结面钢筋应变测试的表面式密布型光栅	陆 飞	李爱群	程文瀼	罗青儿	(398)		
正交异性钢桥面板疲劳性能的局部构造效应	宋永生	丁幼亮	王高新	李爱群	(403)		
后浇 UHTCC 既有混凝土复合梁弯曲疲劳性能试验研究		刘 问	徐世娘	李庆华	(409)		
双向水平加载下钢筋混凝土柱抗震性能的数值模拟		吕大刚	李雁军	王震宇	(414)		
空心板柱结构中柱节点受冲切承载力试验研究	龚启宏	朱 强	梁书亭	徐 澄	汪 杰	(420)	
古建筑木结构拼合梁结构机制			淳 庆	谭志成	陈春超	(425)	
风险态度对建筑工程项目投标均衡策略的影响及对策		成于思	李启明	袁竞峰	(431)		
· 综述 ·							
土木工程信息化发展综述	孙 璐	葛敏莉	李易峰	金姣萍	王登忠	郭 锐	(436)
桥梁高墩抗震研究现状及展望			宗周红	夏 坚	徐绰然	(445)	
· 简讯 ·							
《东南大学学报(自然科学版)》荣获首届江苏省新闻出版政府奖“报刊奖”							(封二)

本期责任编辑：张晓丽

## CONTENTS

- Multiple sound source localization of microphones based on complex exponential transform  
of phase differences ..... Zhao Xiaoyan, Tang Jie, Zhou Lin, Wu Zhenyang (231)
- Matched field localization using correlation of two-hydrophone underwater  
acoustic pulse signals with unknown waveform ..... Li Kun, Fang Shiliang, An Liang (236)
- Loudness and timbre features model of ship radiated noise ..... Cao Hongli, Fang Shiliang (241)
- 2D SVD-FIR filter design based on 1D PCA-EIR technique ..... Wang Hao, Bao Yongqiang, Xi Ji, Zhao Li, Zou Cairong (247)
- TDOA-based wireless positioning method and its performance ..... Shi Xiaohong (252)
- Performance of VHT WLANs under co-channel interference based on interference protection ..... Ji Baofeng, Yang Luxi (258)
- Low-power-aware virtual channel allocation algorithm for network on chip ..... Zhou Fang, Wu Ning, Zhou Lei, Zhang Ying (263)
- An ultra-low-supply-voltage ultra-low-power subthreshold SRAM bitcell design ..... Bai Na, Feng Yue, You Xiaohu, Shi Longxing (268)
- Design of low-power 10 Gbit/s 1:4 demultiplexer in 0.18 μm CMOS ..... Pan Min, Feng Jun (274)
- Maximum lifetime broadcast tree construction algorithm based on particle swarm optimization  
in wireless ad hoc networks using directional antennas ..... Shen Jun, Zhu Xiaoqian (279)
- Routing algorithm based on probability of topology connectivity in vehicular ad hoc networks ..... Tao Jun, Xiao Peng, Liu Ying, Chen Wenqiang (286)
- Minimum attribute reduction enhancing algorithm based on quantum cloud model evolution ..... Ding Weiping, Wang Jiandong, Guan Zhijin, Shi Quan (290)
- State detection method for cloud storage system based on compressive sensing ..... Feng Jing, Zhang Liangliang, Shen Ye, Liang Luping (296)
- Recommendation mechanism based on user voting in the social network ..... Liu Xiwen, Jiang Junjie (301)
- Rotor position estimation of switched reluctance motor based on LSSVM ..... Xu Yuzhe, Cao Yanping, Zhong Rui, Qu Yan, Peng Fulin (307)
- Multivariable coordinated control method of FBC boiler based on LSSVM-GPC ..... Sun Li, Pan Lei, Shen Jiong (312)
- Design of axial-flux coreless permanent magnet brushless dc motor ..... Cao Yongjuan, Huang Yunkai, Jin Long (317)
- Nonlinear data correction method and its application based on hybrid robust  
input-training neural network ..... Ren Shaojun, Si Fengqi, Li Huanhuan, Xu Zhigao (322)
- Heat exchange characteristics of vertical U-tube ground heat exchanger  
with discontinuous operation condition ..... Yang Weibo, Shi Mingheng, Chen Zhenqian (328)
- Four-wheel steering with total sliding mode control ..... Zheng Kaifeng, Chen Sizhong, Wang Ya (334)
- Biomechanical response for periodontal ligament based on hyperelastic model ..... Huang Huixiang, Tang Wencheng, Wu Bin, Yan Bin (340)
- Elastic properties and vibration characteristics of graphene using finite element method ..... Tang Wenlai, Peng Yitian, Ni Zhonghua (345)
- ZrC based composites by reactive melt infiltration ..... Rong Zhidan, Liu Yufu, Zhong Wenjing (350)
- Micro-scale moisture damage characteristics in epoxy asphalt concrete ..... Hu Jing, Qian Zhendong (355)
- Microbial self-healing effects of concrete cracks ..... Qian Chunxiang, Li Ruiyang, Pan Qingfeng, Luo Mian, Rong Hui (360)
- Function and mechanism of microbial mineralization consolidation  
of Zn<sup>2+</sup> under different pollution conditions ..... Lu Zhaowen, Qian Chunxiang, Xu Yanbo, Wang Mingming (365)
- Characterization of microstructure of cement-based materials by multi-cycle-MIP method ..... Xiao Haijun, Sun Wei, Jiang Jinyang, Wang Caihui (371)
- Numerical analysis of factors influencing air flow pattern during air sparging ..... Liu Zhibin, Chen Zhilong, Du Yanjun, Fang Wei (375)
- Analysis of microbial community structure in MBR with different ammonia concentrations  
using fluorescence in situ hybridization ..... Yang Xiaoli, Zhou Na, Chen Ming, Zhang Rui, Song Hailiang, Fu Dafang (380)
- Startup and realization of advanced nitrogen removal of landfill leachate by modified SBR ..... Wang Kai, Wang Shuying, Zhu Rulong, Miao Lei, Peng Yongzhen (386)
- Theoretical and experimental study of new type of mild steel plate damper with opening ..... Li Zongjing, Huang Zhen, Li Aiqun (392)
- Closely distributed surface optical fiber grating applicable to test the strain  
of rebar on bond interface ..... Lu Fei, Li Aiqun, Cheng Wenrang, Luo Qinger (398)
- Local structural effects for fatigue performance of steel orthotropic deck ..... Song Yongsheng, Ding Youliang, Wang Gaoxin, Li Aiqun (403)
- Experimental study on flexural fatigue property of existing concrete beams  
restricted by post-poured UHTCC layer ..... Liu Wen, Xu Shilang, Li Qinghua (409)
- Numerical simulation of seismic performance of reinforced concrete columns  
under biaxial lateral loads ..... Lü Dagang, Li Yanjun, Wang Zhenyu (414)
- Experimental study on punching shear behavior of hollow slab-column interior connection ..... Gong Qihong, Zhu Qiang, Liang Shuting, Xu Cheng, Wang Jie (420)
- Structural mechanism of Chinese traditional timber stitching beams ..... Chun Qing, Tan Zhicheng, Chen Chunchao (425)
- Effects and countermeasures regarding risk attitude in construction procurement equilibrium ..... Cheng Yusi, Li Qiming, Yuan Jingfeng (431)
- Reviews •**
- State-of-the-art review of informatics in civil engineering ..... Sun Lu, Ge Minli, Li Yifeng, Jin Jiaoping, Wang Dengzhong, Guo Rui (436)
- Seismic study of high piers of large-span bridges: an overview and research development ..... Zong Zhouhong, Xia Jian, Xu Chaoran (445)