



中文核心期刊  
中国科技核心期刊

ISSN 1000-0801  
CN 11-2103/TN

# 通信科学

Telecommunications Science

第 29 卷第 11 期

Vol.29 No.11

2013 年 11 月

Nov. 2013



中国通信学会



人民邮电出版社

中国 · 北京 Beijing, China

# 目 录

## 专题:大数据平台与应用

- 1 语音大数据信息处理架构及关键技术研究 杨震,徐敏捷,刘璋峰,秦达,姚晓辉  
6 基于 DPI 数据挖掘实现 URL 分类挂载的相关技术研究 边凌燕,贺仁龙,姚晓辉  
12 分布式文件系统与 MPP 数据库的混搭架构在电信大数据平台中的应用 张雨,蔡鑫,李爱民,刘翼,姚晓辉  
17 电信行业客户行为标签数据对外经营模式研究 姚晓辉,胡源,张宇翔

## 研究与开发

- 23 异构无线传感器网络中一种可恢复数据的安全聚集算法 石鲁生,朱慧博,陈林  
29 无线 mesh 网络中能量空洞规避策略研究 陆春龙,曹玉春,乐光学  
38 面向 WLAN 的分布式无线多步攻击模式挖掘方法研究 陈观林,王泽兵,张泳  
45 一种改进的基于 DCS 的分布式多用户协作频谱感知方法 章坚武,陈晓燕,许晓荣  
52 基于价格时延 Petri 网的超级节点网格调度 潘善亮,黄希,茅琴娇  
60 基于轮询调度的频谱接入机制研究 鲁进,黄铭,杨志军

## 综 述

- 66 泛在网络环境下移动性预测方法的挑战及关键思想 田浩,赵季红,曲桦  
72 水下声学传感器网络研究 何明,陈秋丽,叶旭光,权冀川,陈希亮  
77 移动互联网核心安全需求及防护研究 许方恒,陈暄,沈才樑,杜焕强

## 电力信息化专栏

- 82 混合变换域数字水印在电力系统信息安全中的应用 朱少敏,张志强

**Huahuan 北京华环电子股份有限公司**

**“使信息更加通畅，为顾客创造价值”**

- ◆ 致力于为运营商提供创新性的电信级接入解决方案
- ◆ 成立于1989年1月，清华大学控股的高新技术企业
- ◆ 二十年光接入经验，国内光接入领域的技术引领厂家
- ◆ 产品大规模成功应用于国内外主流运营商

地址：北京市海淀区上地六街26号 电话：010-52046188 网址：[www.huahuan.com](http://www.huahuan.com)

# 通信科学

第29卷第11期 2013年11月

- |                                  |                             |
|----------------------------------|-----------------------------|
| 87 基于某典型实例的配网通信方式研究与比较           | 王 凤,司孝平,赵 方,李朝晖,罗海勇         |
| 94 基于 Tilera 平台的网络细粒度应用行为识别      | 吴 舜,苏 丹,吴 佳,李 坤,许大卫,刘 眇,魏 征 |
| 99 基于异构网络电力应急通信场景的绿色通信方案         | 王春新,李 信,王晓湘,李朝峰,闫 磊         |
| 104 电力突发事件应急标准体系框架研究             | 门永生,金龙哲,朱朝阳,于 振             |
| 109 电力数据中的幂律分布特性                 | 王冠男,邓春宇,赵 悅,郑亚萍             |
| 115 移动办公在发电企业中的研究和应用             | 刘 锋,王 静                     |
| 122 基于分布式电站群的智能数据分析中心建设与实践       | 苏跃进,韩英杰                     |
| 127 电力数据挖掘在电网内部及各领域间的应用          | 耿 亮,吴 燕,孟宪楠                 |
| 131 南宁供电局 J2EE 应用服务中间件监控系统的设计与实现 | 吴一鸣,田永涛                     |

## 运营创新论坛

- |                                       |                         |
|---------------------------------------|-------------------------|
| 136 移动互联网时代流量经营的价值提升策略研究——基于 S 公司实证分析 | 何 驰,张明光,李 璞             |
| 146 论自研智能终端操作系统                       | 魏颖琪,梁柏青                 |
| 152 综合审计与责任分析系统关键技术与设计原理              | 周春楠                     |
| 159 固网运营商流量经营策略研究                     | 阮 科,冯 明,朱永庆,邹 浩         |
| 163 短消息业务评估体系的研究与实现                   | 李 洪,周文红,渠 凯,伍思源,陈思中,李 青 |
| 168 基于业务流程粒度的安全风险管理分析及应用              | 谭 彬                     |
| 173 路由器性能测试中蛇形测试的局限性探讨                | 郭 亮,王素彬,赵隽琪,陈 隅         |

简讯 76,81,86,93,98,126,167

## Huahuan 北京华环电子股份有限公司

- ◆ MSAP多业务接入平台
- ◆ SDH/MSTP STM-1/4/16光传输设备
- ◆ PDH光传输设备
- ◆ PCM综合业务复用设备
- ◆ 协议转换器设备
- ◆ 光纤收发器设备
- ◆ TDM over IP设备等

地址：北京市海淀区上地六街26号 电话：010-52046188 网址：[www.huahuan.com](http://www.huahuan.com)

# Telecommunications Science

November 2013 (Vol.29 No.11)

- Study of Audio Frequency Big Data Processing Architecture and Key Technology ..... Yang Zhen, Xu Minjie, Liu Zhangfeng, Qin Da, Yao Xiaohui(1)
- Research on URL Classification with DPI Data Mining and Related Technology ..... Bian Lingyan, He Renlong, Yao Xiaohui(6)
- Application of Distribute File System & MPP Database Mashup Architecture in Telecom Big Data Platform ..... Zhang Yu, Cai Xin, Li Aimin, Liu Yi, Yao Xiaohui(12)
- Research on the Entered Business Model of Telecom Customer Behavior Tagged Data ..... Yao Xiaohui, Hu Yuan, Zhang Yuxiang(17)
- Security Data Aggregation with Recoverable Data in Heterogeneous Wireless Sensor Network ..... Shi Lusheng, Zhu Huibo, Chen Lin(23)
- Research on Avoidance of Energy Hole Scheme in the Wireless Mesh Network ..... Lu Chunlong, Cao Yuchun, Yue Guangxue(29)
- Research on Distributed Wireless Multi-Step Attack Pattern Mining Method for WLAN ..... Chen Guanlin, Wang Zebing, Zhang Yong(38)
- An Improved Distributed Multi-User Cooperative Spectrum Sensing Method Based on DCS ..... Zhang Jianwu, Chen Xiaoyan, Xu Xiaorong(45)
- Grid Scheduling of Super-Peer Model Based on Price Timed Petri Net ..... Pan Shanliang, Huang Xi, Mao Qinjiao(52)
- Research on Spectrum Access Mechanism Based on Polling Scheduling ..... Lu Jin, Huang Ming, Yang Zhijun(60)
- Challenges and Solutions of Mobility Prediction Technology in Ubiquitous Network ..... Tian Jie, Zhao Jihong, Qu Hua(66)
- Study on Underwater Acoustic Sensor Network ..... He Ming, Chen Qiuli, Ye Xuguang, Quan Jichuan, Chen Xiliang(72)
- Research of Mobile Internet Core Security Requirement and Protection ..... Xu Fangheng, Chen Xuan, Shen Cailiang, Du Huanqiang(77)
- Application of Hybrid Transform Domain Digital Watermarking in Power System Information Security ..... Zhu Shaomin, Zhang Zhiqiang(82)
- Research and Comparison of Distribution Automation Communication Mode Based on a Typical Case ..... Wang Feng, Si Xiaoping, Zhao Fang, Li Zhaojun, Luo Haiyong(87)
- Fine-Grained Network Traffic Identification Based on Tilera Platform ..... Wu Shun, Su Dan, Wu Jia, Li Kun, Xu Dawei, Liu Yun, Wei Zheng(94)
- Green Communication Schemes of Heterogeneous Network-Based Electricity Emergency Communication Scene ..... Wang Chunxin, Li Xin, Wang Xiaoxiang, Li Zhaojun, Yan Lei(99)
- Research on Emergency Standard Framework of Power Emergencies ..... Men Yongsheng, Jin Longzhe, Zhu Chaoyang, Yu Zhen(104)
- Power Law Distribution in Electric Power Data ..... Wang Guannan, Deng Chunyu, Zhao Yue, Zheng Yaqin(109)
- Research and Application of Mobile OA Technology in Power Generation Enterprise ..... Liu Zheng, Wang Jing(115)
- Construction and Practice of Intelligent Data Analysis Center Based on Distributed Power Plant ..... Su Yuejin, Han Yingjie(122)
- Application of Power Data Mining Within and Between Grid Fields ..... Geng Liang, Wu Yan, Meng Xiannan(127)
- Design and Implementation of J2EE Application Service Middleware Monitoring System of Nanning Power Supply Bureau ..... Wu Yiming, Tian Yongtao(131)
- Strategy Study to Enhance the Value of Telecom Operators Based on Traffic Management  
—Empirical Analysis of S Corporation ..... He Biao, Zhang Mingguang, Li Lu(136)
- Research on Smartphone Operation System Development ..... Wei Yingqi, Liang Boqing(146)
- Key Technology and Design Philosophy of the System of Global Audit and Duty Analysis ..... Zhou Chunnan(152)
- Research on Wireline Operators' Traffic-Based Operations Strategy ..... Ruan Ke, Feng Ming, Zhu Yongqing, Zou Jie(159)
- Research on Evaluation System of Short Message Service ..... Li Hong, Zhou Wenhong, Qu Kai, Wu Siyuan, Chen Sizhong, Li Qing(163)
- Analysis and Application of Security Risk Management Based on Business Process Granularity ..... Tan Bin(168)
- Research on Limitation of Snake Flow Test in Routers' Performance Test ..... Guo Liang, Wang Subin, Zhao Junqi, Chen Hua(173)

Chief Editor: Yi Dongshan

Vice Chief Editor: Wu Nada

Sponsor: China Institute of Communications

Posts and Telecommunications Press

Editor: *Telecommunications Science* Magazine Office (F8, You Dian Publisher Building, No.11

Chengshousi Road, Fengtai District, Beijing 100164, China)

General Distribution Office: Beijing Newspapers and Periodicals Distribution Office

Overseas Distributor: China International Book Trading Corporation (P.O.Box 399, Beijing, China)

万方数据