



中国计算机学会会刊
Publication of China Computer Federation

ISSN 1000-7024
CODEN JIGYEP

计算机工程与设计

Computer Engineering and Design

2014年1月 第35卷 第1期

Vol. 35 No. 1 Jan. 2014

1
2014

中国航天科工集团第二研究院706所主办

计算机工程与设计

(JISUANJI GONGCHENG YU SHEJI)

2014 年 1 月 第 35 卷 第 1 期

目 次

信息安全技术

- 可信网络跨域接入技术研究 计 龙, 鄢楚平, 张先国, 张钧媛, 张立茹(1)
电力智能终端安全评估模型 姜政伟, 王 栋, 王怀宇, 杨泽明, 刘宝旭(6)
基于离散混沌系统广义同步的 S 盒的设计 韩丹丹, 臧鸿雁, 闵乐泉(11)
虚拟机监视器系统策略完整性安全机制 龚敏斌, 潘 理, 姚立红(17)
基于粗糙集理论的冗余规则处理方法 陈 超, 陈性元, 汪永伟, 代向东(21)
基于 3D-DCT 和混沌加密的医学体数据多水印算法 刘瑶利, 李京兵(26)
基于公钥的 EAP-AKA 协议改进及安全性分析 董春冻, 王 聰, 刘 军, 周 星, 张玉静(32)
基于状态机模型的网络安全策略验证方法研究 程晓荣, 冯志伟(37)
基于 DWT-SVD 的音频零水印算法 蔡咏梅, 郭文强(42)
云环境下的隐私保护密文排序查询 孔凡新, 刘 丽(47)

网络与通信技术

- 支持预部署的机顶盒 P2P 点播系统 宋 军, 邓浩江, 尤佳莉(51)
基于时间调度表的无线传感器网络 MAC 协议 龙昭华, 马永建, 蒋贵全, 陈丹丹(56)
无线传感网中基于 BP 神经网络的数据融合方法 樊雷松, 强 彦, 赵涓涓, 胡洋洋, 格 磊(62)
改进相空间混沌及其在扩频通信中的应用 李杜娟, 吴成茂(67)
3G/WLAN 网络终端能量感知的动态负载均衡机制 罗俊辉, 白光伟, 沈 航, 曹 磊(74)
一维线性稀疏车载自组网感染路由性能研究 孙海峰, 罗光春, 秦 科(82)
基于位置更新与数据转发分离的 NEMO 优化机制 汤红波, 唐 伟; 王领伟(87)
无线 Mesh 网络终端用户吞吐量研究 谢玉城, 李陶深, 葛志辉(93)
基于 N-P 决策融合准则的传感器网络最优检测机制 曹义亲, 薛海英, 袁朝晖(97)

嵌入式系统工程

- 基于 i.MX53 嵌入式公交电子站牌设计 柴艳峰, 熊运余, 吴志红(102)

基于统计分析和预测的低内存进程管理算法	姜 艳, 曾学文, 孙 鹏(107)
高性能 DSP 软核中 DMA 控制器的设计与验证	郑 挺, 李 勇(112)
基于 Android 平台手机游戏引擎的设计与实现	黎忠文, 覃志东, 王全宇, 倪仲余(119)

软件与算法

无线传感器节点 SoC 事务级功耗仿真器设计	刘 玮, 李翔宇, 殷树娟(125)
基于 Hadoop 的电子商务推荐系统的设计与实现	李文海, 许舒人(130)
同步数据流语言时态消去的可信翻译	张玲波, 甘元科, 石 刚, 王生原, 董 渊, 张智慧, 王沿海(137)
低复杂度最大似然 MIMO 信号检测算法	赵新雪, 李 琼, 肖维杰, 高 强(144)
基于图的三阶段 Web 服务组合方法	孙朋姣, 郭学俊, 张鹏程(148)
基于区域分解技术的并行四面体网格生成算法	徐 权, 崔 涛, 刘青凯, 曹小林(153)
UD 分解自适应滤波在 SINS 初始对准中的应用	郜福全, 陈丽容, 丁传红, 刘建锋(158)
分布式铁路车辆分布组件的设计与实现	孙学波, 李昕妍(163)
基于概念格亏值的共轭对方法研究	梁 妍, 吴 杰, 马 垣, 沈明钢(171)
多数据源冲突的主数据真值发现算法	王继奎, 李少波(177)

多媒体技术

基于改进 Shape Context 的分层交通标志识别系统	秦 瑾, 张新峰(183)
基于暗原色先验及运动检测的视频去雾方法	刘东辉, 兰时勇, 杨红雨, 吴树霖, 朱超军(188)
简单多边形裁剪算法	宋树华, 濮国梁, 罗 旭, 陈 东, 陈润强(192)
基于顶帽变换的反锐化掩膜算法	王 婷, 上官宏, 刘 祎, 桂志国(198)
基于 RGB-D 传感器的 3D 室内环境地图实时创建	朱笑笑, 曹其新, 杨 扬, 陈培华(203)
隐含先验约束 MRF 模型的目标形状分割方法	孙建中, 熊忠阳, 张玉芳(208)
结合区域生长的多尺度分水岭算法的肺分割	杨建峰, 赵涓涓, 强 彦, 王 全(213)
结合 Tsallis 熵的各向异性扩散模型	彭 扬, 何传江, 任泽民, 邹黎敏(218)
三帧差法和 Mean-shift 结合的行人检测与跟踪研究	姚 倩, 安世全, 姚 路(223)
瑞利微调双边滤波超声图像降噪去斑算法	陆玉婧, 李海燕, 费勤水, 张榆锋, 陈建华, 施心陵(228)
带钢表面缺陷检测方法	茅正冲, 时文静, 邬 锋(233)
基于支持向量机的 Laplacian 网格曲面孔洞修补算法	许 斌, 李忠科, 宋大虎(237)
基于机器视觉的教室多目标跟踪算法设计与实现	李骈臻, 李 震(243)

智能技术

结合属性重要度和灰色关联度的数据补齐方法	王方心, 潘 巍, 吴立锋, 金声震, 李晓娟(248)
基于 HSDM 的企业财务危机预警	王英博, 聂娜娜, 李仲学(255)

基于自适应缩放比例因子的差分进化算法	沈佳杰, 江 红, 王 肃(261)
多视角下多模板人脸特征定位方法	傅由甲(267)
基于密度的半监督复杂网络聚类算法	孟凡荣, 张可为, 朱 牧(271)
基于 ICA 的谱聚类方法在特征捆绑中的应用	董云云, 邢桂阳, 邓红霞, 李海芳(276)
基于粗糙 RBF 神经网络的气象数据插补方法研究	唐慧强, 李全月, 刘钲江(282)
基于 Jena 的土地适宜性评价本体知识库构建研究	巫建伟, 陈崇成, 叶晓燕, 林甲祥(287)
稀疏 L1 范数最小二乘支持向量机	梁锦锦, 吴 德(293)

开发与应用

基于 CUDA 对 RNA 二级结构预测的并行研究	陈 飞, 郝福珍(297)
6-PUS/UPU 并联机构开放式控制系统的研究	梁顺攀, 窦玉超, 赵永生(303)
基于 Tika 和 Lucene 的桌面搜索引擎研究与实现	王旭仁, 郑秋辉, 何发镁, 李 娜, 王彦丽(310)
农药残留检测数据分析系统的研究与实现	侯 塑, 巩丽伟, 雷 霆, 陈 谊(315)
基于 WebGIS 的气象信息服务系统的设计与实现	刘茜茜, 孙亚琴, 吕 翔, 彭明艳, 雷 洋, 杨 慧(322)
基于模板和领域本体的 Deep Web 信息抽取研究	顾韵华, 高 原, 高 宝, 杜 杰(327)
基于类别参与度的社区问答专家发现方法	林鸿飞, 王 健, 熊大平, 刘晓鸣(333)
气象预警信息智能接收处理系统的设计与实现	陈苏婷, 张 燕, 张艳艳(339)
面向智慧社区的物联网架构研究	宫艳雪, 武智霞, 郑树泉, 丁志刚(344)
面向产业链协同 SaaS 平台的企业群应用配置技术研究	钟 军, 王淑营, 刘述雅, 李月霞(350)
基于 CIM 模型的电网层次编码设计与实现	董张卓, 孔永超, 赵元鹏(357)

本期责任编辑:韩庭

本刊为:

- ★中国计算机学会会刊
- ★中国宇航学会会刊
- ★英国《科学文摘》(SA, INSPEC)源期刊
- ★俄罗斯《文摘杂志》(AJ of VINITI)源期刊
- ★美国《乌利希期刊指南》(UPD)源期刊
- ★波兰《哥白尼索引》(IC)源期刊

- ★全国中文核心期刊(中文核心期刊要目总览 2011 版)
- ★中国科技核心期刊(中国科技论文统计源期刊)
- ★《中国科学引文数据库(CSCD)》收录期刊
- ★《中国学术期刊综合评价数据库》收录期刊
- ★《中国学术期刊网络出版总库(CNKI)》收录期刊
- ★《万方数据—数字化期刊群》收录期刊
- ★《中国学术期刊文摘(中文版)》收录期刊
- ★《电子科技文摘数据库》收录期刊

期刊基本参数: CN 11-1775/TP * 1980 * m * A4 * 360 * zh * P * ¥38.00 * 66 * 2014-01

Computer Engineering and Design

Vol. 35 No. 1 Jan. 2014

CONTENTS

Information Security Technology

- Trusted network cross-domain access technology research JI Long, YAN Chu-ping, ZHANG Xian-guo, et al(1)
Model for power smart terminal security assessment JIANG Zheng-wei, WANG Dong, WANG Huai-yu, et al(6)
Design of S-box based on theorem of generalized synchronization for discrete chaos systems
..... HAN Dan-dan, ZANG Hong-yan, MIN Le-quan(11)
Secure mechanism of policy integrity in virtual machine monitors system GONG Min-bin, PAN Li, YAO Li-hong(17)
Redundant rules process based on rough set theory CHEN Chao, CHEN Xing-yuan, WANG Yong-wei, et al(21)
Multiple watermarks for medical volume data based on 3D-DCT and Logistic Map LIU Yao-li, LI Jing-bing(26)
Amendment and security analysis of EAP-AKA protocol based on public key
..... DONG Chun-dong, WANG Cong, LIU Jun, et al(32)
Research on verification of network security policy based on state machine CHENG Xiao-rong, FENG Zhi-wei(37)
Audio zero watermark algorithm based on DWT-SVD CAI Yong-mei, GUO Wen-qiang(42)
Privacy-preserving rank query over ciphertext data in cloud computing KONG Fan-xin, LIU Li(47)

Network and Communications Technology

- P2P-vod system for set-top box with pre-deployment module SONG Jun, DENG Hao-jiang, YOU Jia-li(51)
Wireless sensor networks MAC protocol based on order schedule table design
..... LONG Zhao-hua, MA Yong-jian, JIANG Gui-quan, et al(56)
Data fusion method based on BP neural network in wireless sensor networks
..... FAN Lei-song, QIANG Yan, ZHAO Juan-juan, et al(62)
Improved phase space chaos and its application in spread spectrum communication LI Du-juan, WU Cheng-mao(67)
Energy-aware dynamic load balance mechanism in integrated 3G/WLAN networks
..... LUO Jun-hui, BAI Guang-wei, SHEN Hang, et al(74)
Performance analysis of epidemic routing in one-dimensional linear sparse VANETs
..... SUN Hai-feng, LUO Guang-chun, QIN Ke(82)
Locate updating and packet forwarding separation based optimization mechanism for NEMO
..... TANG Hong-bo, TANG Wei, WANG Ling-wei(87)
Study of end-user throughput in wireless mesh networks XIE Yu-cheng, LI Tao-shen, GE Zhi-hui(93)
N-P fusion based optimal detection scheme in wireless sensor networks CAO Yi-qin, XUE Hai-ying, YUAN Zhao-hui(97)

Embedded System Engineering

- Design of embedded electronic bus-stop board based on i. MX53 CHAI Yan-feng, XIONG Yun-yu, WU Zhi-hong(102)
Low memory killer algorithm based on statistical analysis and predicting JIANG Yan, ZENG Xue-wen, SUN Peng(107)

Design and verification of DMA controller for high performance DSP soft-core	ZHENG Ting, LI Yong(112)
Design and implementation of mobile game engine based on Android platform .....	..... LI Zhong-wen, QIN Zhi-dong, WANG Quan-yu, et al(119)

Software and Arithmetic

Design of transaction-level wireless sensor node SoC power consumption simulator .....	..... LIU Wei, LI Xiang-yu, YIN Shu-juan(125)
Design and implementation of recommendation system for E-commerce on Hadoop .....	..... LI Wen-hai, XU Shu-ren(130)
Certified translation for eliminating temporal feature of synchronous dataflow program .....	..... ZHANG Ling-bo, GAN Yuan-ke, SHI Gang, et al(137)
Low-complexity ML signal detection algorithm for MIMO system .....	..... ZHAO Xin-xue, LI Qiong, XIAO Wei-jie, et al(144)
Approach to web service composition in three phases based on graph .....	..... SUN Peng-jiao, GUO Xue-jun, ZHANG Peng-cheng(148)
Parallel tetrahedral mesh generation algorithm based on domain decomposition .....	..... XU Quan, CUI Tao, LIU Qing-kai, et al(153)
Initial alignment of SINS based on UD factorized adaptive filter .....	..... GAO Fu-quan, CHEN Li-rong, DING Chuan-hong, et al(158)
Design and implication of a distributed visual component for railway rolling stocks distribution .....	..... SUN Xue-bo, LI Xin-yan(163)
Research on method of conjugate pairs based on waned values from concept lattice .....	..... LIANG Yan, WU Jie, MA Yuan, et al(171)
Master data discovery algorithm of multiple source conflict .....	..... WANG Ji-kui, LI Shao-bo(177)

Multimedia Technology

Hierarchical traffic sign recognition system based on improved shape context .....	..... QIN Jin, ZHANG Xin-feng(183)
Video haze removal approach based on dark channel prior and object detection .....	..... LIU Dong-hui, LAN Shi-yong, YANG Hong-yu, et al(188)
Algorithm for simple polygon clipping .....	..... SONG Shu-hua, PU Guo-liang, LUO Xu, et al(192)
Unsharp masking algorithm based on top-hat transform .....	..... WANG Ting, SHANGGUAN Hong, LIU Yi, et al(198)
RGB-D sensor based real-time 3D map building for indoor environment .....	..... ZHU Xiao-xiao, CAO Qi-xin, YANG Yang, et al(203)
MRF model with implicit shape prior for object shape segmentation .....	..... SUN Jian-zhong, XIONG Zhong-yang, ZHANG Yu-fang(208)
Lung CT image segmentation combined multi-scale watershed method and region growing method .....	..... YANG Jian-feng, ZHAO Juan-juan, QIANG Yan, et al(213)
Local Tsallis entropy combined anisotropic diffusion model .....	..... PENG Yang, HE Chuan-jiang, REN Ze-min, et al(218)
Algorithms of pedestrian detection and tracking based on three frame difference method and mean-shift algorithm .....	..... YAO Qian, AN Shi-quan, YAO Lu(223)
Noise and speckle reduction of ultrasonic images using an improved Rayleigh-trimmed bilateral filtering algorithm .....	..... LU Yu-jing, LI Hai-yan, FEI Qin-shui, et al(228)

Strip surface defect detection method	MAO Zheng-chong, SHI Wen-jing, WU Feng(233)
Hole repairing algorithm in triangular mesh surface based on support vector machines and Laplacian	XU Bin, LI Zhong-ke, SONG Da-hu(237)
Development of classroom multi-objects tracking algorithm based on machine vision	LI Pian-zhen, LI Zhen(243)

Intelligent Technology

Missing data imputation method combining attribute significance and grey correlation	WANG Fang-xin, PAN Wei, WU Li-feng, et al(248)
Financial crisis warning based on HSDM	WANG Ying-bo, NIE Na-na, LI Zhong-xue(255)
Improved differential evolution algorithm based on adaptive scaling factor	SHEN Jia-jie, JIANG Hong, WANG Su(261)
Multi-template facial features localization algorithm on multi-view face	FU You-jia(267)
Density-based semi-supervised clustering algorithm in complex network	MENG Fan-rong, ZHANG Ke-wei, ZHU Mu(271)
Spectral clustering based on ICA for feature binding	DONG Yun-yun, XING Gui-yang, DENG Hong-xia, et al(276)
Meteorological data interpolation method based on rough RBF neural network	TANG Hui-qiang, LI Quan-yue, LIU Zheng-jiang(282)
Construction of ontology knowledge base for land suitability evaluation based on Jena	WU Jian-wei, CHEN Chong-cheng, YE Xiao-yan, et al(287)
Sparse least square support vector machine with L1 norm	LIANG Jin-jin, WU De(293)

Developments and Applications

CUDA based parallel research of RNA secondary structure prediction	CHEN Fei, HAO Fu-zhen(297)
Research on open architecture control system of 6-PUS/UPU parallel mechanism	LIANG Shun-pan, DOU Yu-chao, ZHAO Yong-sheng(303)
Research and implementation of desktop search engine based on Tika and Lucene	WANG Xu-ren, ZHENG Qiu-hui, HE Fa-mei, et al(310)
Study and its implementation of analysis system for pesticide residues detection data	HOU Kun, GONG Li-wei, LEI Ting, et al(315)
Design and implementation of meteorological service information system based on WebGIS	LIU Xi-xi, SUN Ya-qin, LÜ Xiang, et al(322)
Research on Deep Web information extraction based on template and domain ontology	GU Yun-hua, GAO Yuan, GAO Bao, et al(327)
Category participation-based approach to find experts for community question answer services	LIN Hong-fei, WANG Jian, XIONG Da-ping, et al(333)
Design and implementation of intelligent receiving system for early warning information	CHEN Su-ting, ZHANG Yan, ZHANG Yan-yan(339)
Research on IOT architecture for smart community	GONG Yan-xue, WU Zhi-xia, ZHENG Shu-quan, et al(344)
Research on enterprise group application configuration technologies for SaaS-based collaborative platform of industrial-chain	ZHONG Jun, WANG Shu-ying, LIU Shu-ya, et al(350)
Design and implementation of grid level coding based on CIM	DONG Zhang-zhuo, KONG Yong-chao, ZHAO Yuan-peng(357)

CALL FOR PAPERS: IEEE SECON 2014

11th IEEE International Conference on Sensing, Communication, and Networking
SECON 2014 June 30-July 3, 2014 Singapore <http://www.ieee-secon.org/>

The 11th annual IEEE SECON conference will provide a unique forum to exchange innovative research ideas, recent results, and share experiences among researchers and practitioners in the field of sensing and communication in wireless networks. The focus of SECON is novel communication technologies and emerging applications and services, involving mobile sensing and communication, cyber-physical systems, and ubiquitous and pervasive computing.

TOPICS OF INTEREST: Papers describing original, previously unpublished research work, experimental efforts, practical experiences, and industrial and commercial developments in all aspects of sensor and wireless communications and networking are solicited. Within this domain, particular topics of interest are included, but are not limited to: Software Defined Networking for mobile and wireless networks/Network coding, MIMO, compressed sensing/White space, cooperative and cognitive communications/Novel smartphone-based sensing systems, tools, applications and experiences/Novel applications: cyber-physical systems, Internet of Things, distributed mobile computing/New technologies, e.g. UWB, RFID, NFC, visible light & underwater communications/Low power and energy limited sensing and communications, including energy-harvesting/Cellular communications and data networks/Mesh, ad-hoc, vehicular, and disruption tolerant networks/Measurement of wireless and sensor systems, and novel experimental testbeds/Security, privacy, and trustworthiness of mobile, wireless and sensor systems/Survivability, network management, and fault tolerance/Modeling, algorithms, and performance evaluation/MAC, network, transport, application protocols and cross-layer design.

IMPORTANT DATES: Abstract Registration: 11:59pm EST on December 6, 2013; Paper Submission Deadline: 9:00pm EST on December 13, 2013. Note: Paper submission deadline is a hard deadline! Acceptance Notification: March 15, 2014. Camera Ready: April 15, 2014.

计算机工程与设计

(月刊, 1980 年创刊)

第 35 卷 第 1 期 (总第 325 期) 2014 年 1 月 16 日

Computer Engineering and Design

(Monthly, Started in 1980)

Vol. 35 No. 1 (Sum No. 325) 2014/01/16

主管单位 中国航天科工集团公司

Authorited by: China Aerospace Science & Industry Corporation

主办单位 中国航天科工集团二院 706 所

Sponsored by: Institute 706 Second Academy of CASIC

主 编 沈志达

Chief Editor: SHEN Zhi-da

编辑出版 《计算机工程与设计》编辑部

Edited&Published by: Editorial Dept of Computer Engineering & Design

通信地址 北京 142 信箱 37 分箱, 100039

Address: P. O. Box 142-37, Beijing, 100039, China

电 话 010-68389884

Telephone: 8610-68389884

网 址 www.china-ced.com

Web Site: <http://www.china-ced.com>

电子邮箱 ced@china-ced.com

E-mail: ced@china-ced.com

印刷装订 北京科信印刷有限公司

Printed by: Beijing Kexin Printing Co., Ltd.

总发行处 北京市报刊发行局

Distributed by: Beijing Bureau for Distribution of Newspapers and Journals

订购处 全国各邮电局

Domestic: All Local Post Offices in China

国际标准刊号: ISSN 1000-7024

公开发行

邮发代号: 82-425

国内统一刊号: CN 11-1775/TP

国内定价: 38 元/册

ISSN 1000-7024



9 771000 702140