



中国计算机学会会刊

ISSN 1001-9081
CN 51-1307/TP
CODEN JYIIDU

计算机应用

JOURNAL OF COMPUTER APPLICATIONS

- 中文核心期刊
- 两届国家期刊奖提名奖
- 全国优秀科技期刊一等奖



第37卷
Vol. 37

第1期
No. 1

2017年1月
Jan. 2017



四川省计算机学会
中国科学院成都分院

主办

2017
第 **1** 期

国家期刊奖获奖期刊	中文科技期刊数据库收录期刊
中国期刊方阵“双奖”期刊	英国《科学文摘》收录期刊
中文核心期刊	俄罗斯《文摘杂志》收录期刊
中国科技核心期刊	《日本科学技术振兴机构数据库》收录期刊
中国计算机学会会刊	美国《剑桥科学文摘》收录期刊
中国科技论文统计源期刊	波兰《哥白尼索引》收录期刊
中国科学引文数据库刊源期刊	德国《数学文摘》收录期刊
中国学术期刊综合评价数据库统计源期刊	CEPS 中文电子期刊服务全文收录期刊
中国期刊网、中国学术期刊(光盘版)收录期刊	RCCSE 中国核心学术期刊

计 算 机 应 用

(Jisuanji Yingyong)

第 37 卷 第 1 期 2017 年 1 月

目 次

2016 年全国开放式分布与并行计算学术年会(DPCS2016) 论文

面向虚拟路由器平台的资源管理平面的设计与实现·····	高先明,王宝生,李同标,薛华威(1)
面向动态虚拟网络请求的虚拟网络映射算法 ·····	苑 迎,王 聪,王翠荣,宋 欣,吕艳霞(6)
基于直接后继节点完成时间的异构调度算法 ·····	王 冠,王宇新,陈 鑫,王 飞,郭 禾(12)
面向移动群智感知的多任务分发算法 ·····	徐 哲,李 卓,陈 昕(18)
面向软件即服务的负载均衡策略建模与分析·····	明 利,李 彤,秦江龙,郑 明,蒋旭东,谢仲文(24)
融合 P2P 技术的云平台快速内容分发方法 ·····	刘 靖,赵文举(31)
MapReduce 并行加速数据流多模式相似性搜索 ·····	付 晨,钟 诚,叶 波(37)
二维不可压缩 Navier-Stokes 方程的并行谱有限元法求解 ·····	胡园园,谢 江,张 武(42)
基于双层索引结构的起源图查询方法·····	许国艳,罗章璇,宋 健,吕 鑫(48)
基于轨迹结构的移动对象热点区域发现 ·····	吕绍仟,孟凡荣,袁 冠(54)
感知受限的移动传感器节点扫描覆盖优化算法 ·····	神显豪,李 军,奈 何(60)
基于动态分簇的移动目标追踪方法·····	包 威,毛莺池,王龙宝,陈小丽(65)
基于命名数据网络的车载自组织网络数据分发机制·····	邓 健,董柏宏,曹 慧,吴丽娟,张 波,吴维刚(73)
基于弱状态的车载网数据转发策略 ·····	黄 丹,黄 燕,环 天(79)
软件定义车联网的数据转发机制 ·····	杨志伟,陈昊亮,张 波,吴丽娟,吴维刚(84)
基于 Prim 初始种群选取优化遗传算法的三维片上网络低功耗映射 ·····	宋国治,王 铖,涂 遥,张大坤(90)
长期演进网络中基于粒子群的天线下倾角自优化方法·····	连晓灿,张彭园,谭国平,李岳衡(97)
分层检查点的近似最优周期计算模型 ·····	吕宏武,谷 雷,王慧强,邹世辰,冯光升(103)
基于离散粒子群算法的测试用例优先排序 ·····	张卫祥,齐玉华,李德治(108)
帮助线程预取质量的实时在线评价方法·····	张建勋,古志民(114)
基于攻击威胁监控的软件保护方法 ·····	汤战勇,李 振,张 聪,龚晓庆,房鼎益(120)
基于 Web 行为轨迹的应用层 DDoS 攻击防御模型·····	刘泽宇,夏 阳,张义龙,任 远(128)
基于 CUDA 的行车安全预警方法 ·····	赵永涛,陈庆奎,方玉玲,赵德玉,姬丽娜(134)
M-TAEDA:多变量水质参数时序数据异常事件检测算法 ·····	毛莺池,齐 海,接 青,王龙宝(138)
基于 GPU 的视频流人群实时计数 ·····	姬丽娜,陈庆奎,陈圆金,赵德玉,方玉玲,赵永涛(145)

面向套牌甄别的流式计算系统 乔 通,赵卓峰,丁维龙(153)

基于物联网的智能家居远程无线监控系统设计 邓 昀,李朝庆,程小辉(159)

移动支付近场通信智能水表系统 张呈钰,王让定,姚 灵,傅松寅,左富强,高旗飞,蒋 铭(166)

适用于多层住宅楼结构的无线智能水表抄表系统..... 傅松寅,王让定,姚 灵,张呈钰,单观敏,胡国伟(170)

基于功率谱及有限穿越可视图的癫痫脑电信号分析算法 王若凡,刘 静,王 江,于海涛,曹亦宾(175)

网络与通信

基于压缩感知的无线传感器网络动态采样方法..... 宋 洋,黄志清,张严心,李梦佳(183)

压缩感知中测量矩阵构造综述 王 强,张培林,王怀光,杨望灿,陈彦龙(188)

基于反双曲正弦函数的抗冲激块稀疏自适应滤波算法..... 魏丹丹,周 翊,师黎明,刘宏清(197)

网络空间安全

基于 BitTorrent 协议 Have 消息的信息隐藏方法 高 斌,翟江涛,戴跃伟(200)

基于增量学习算法的校园网垃圾邮件检测模型 陈 斌,东一舟,毛明荣(206)

基于时间的多层防火墙访问控制列表策略审计方案..... 王旭东,陈清萍,李 文,张信明(212)

面向分级身份密码批验签的错误签名混合筛选算法 徐国愚,王颖锋,马小飞,王科锋,颜若愚(217)

人工智能

基于内涵亏值的概念格渐进式构建 吴 杰,梁 妍,马 垣(222)

基于多标签学习的卷积神经网络的图像标注方法 高耀东,侯凌燕,杨大利(228)

本体与条件随机场结合的涉农商品名称抽取与类别标注 黄念娥,黄 河,王儒敬(233)

混沌布谷鸟搜索算法在谐波估计中的应用..... 牛海帆,宋卫平,宁爱平,马艺元(239)

计算机视觉与虚拟现实

基于多层支持向量机的极化合成孔径雷达特征分析与分类 宋 超,徐 新,桂 容,谢欣芳,徐 丰(244)

基于改进深度信息的手势分割与定位 林海波,王圣彬,张 毅(251)

基于 RGB-D 图像核描述子的物体识别方法 骆 健,蒋 旻(255)

三维人脸建模及在跨姿态人脸匹配中的有效性验证..... 李昕昕,樊 勋(262)

基于导向图优化的单幅图像深度去雾算法 董宇飞,杨 燕,曹碧婷(268)

基于莱特准则的椭圆拟合优化算法..... 曹俊丽,李居峰(273)

应用前沿、交叉与综合

知识驱动的游戏攻略自动标注算法 陈环环,陈小红,阮 彤,高大启,王昊奋(278)

基于 AdaBoost 分类器的实时交通事故预测 张 军,胡震波,朱新山(284)

基于内三角形质心算法的超宽带室内定位..... 魏 培,姜 平,贺晶晶,张会猛(289)

随机噪声干扰下的迭代学习控制器设计..... 夏 浩,张丽杰(294)

基于贝叶斯网络的航班保障服务时间动态估计 邢志伟,唐云霄,罗 谦(299)

2017 年组稿方向 (封二)

2017 年征订启事 (封二)

致谢审稿专家 (封三)

2016 年度审稿专家名单 (封三)

Journal of Computer Applications

Vol. 37 No. 1 Jan 2017

Contents

2016 CCF Annual Conference on Distributed and Parallel Computing Systems (DPCS2016)

Design and implementation of resource management plane in virtual router platform	GAO Xianming, WANG Baosheng, LI Tongbiao, XUE Huawei (1)
Virtual network embedding algorithm for dynamic virtual network requests	YAUN Ying, WANG Cong, WANG Cuirong, SONG Xin, LYU Yanxia (6)
Heterogeneous scheduling algorithm with immediate successor finish time	WANG Guan, WANG Yuxin, CHEN Xin, WANG Fei, GUO He (12)
Multi-task assignment algorithm for mobile crowdsensing	XU Zhe, LI Zhuo, CHEN Xin (18)
SaaS-oriented modeling and analysis of load balancing strategy	MING Li, LI Tong, QIN Jianglong, ZHENG Ming, JIANG Xudong, XIE Zhongwen (24)
Fast content distribution method of integrating P2P technology in cloud platform	LIU Jing, ZHAO Wenju (31)
Accelerating parallel searching similar multiple patterns from data streams by using MapReduce	FU Chen, ZHONG Cheng, YE Bo (37)
Solution of two dimensional incompressible Navier-Stokes equation by parallel spectral finite element method	HU Yuanyuan, XIE Jiang, ZHANG Wu (42)
Provenance graph query method based on double layer index structure	XU Guoyan, LUO Zhangxuan, SONG Jian, LYU Xin (48)
Trajectory structure-based moving object hotspots discovery	LYU Shaoqian, MENG Fanrong, YUAN Guan (54)
Sweep coverage optimization algorithm for mobile sensor node with limited sensing	SHEN Xianhao, LI Jun, NAI He (60)
Moving target tracking scheme based on dynamic clustering	BAO Wei, MAO Yingchi, WANG Longbao, CHEN Xiaoli (65)
Named data networking based data dissemination mechanism for vehicular Ad Hoc network	DENG Jian, DONG Baihong, CAO Hui, WU Lijuan, ZHANG Bo, WU Weigang (73)
Data forwarding strategy based on weak state in vehicular Ad Hoc network	HUANG Dan, HUANG Yan, HUAN Tian (79)
Data forwarding mechanism in software-defined vehicular Ad Hoc network	YANG Zhiwei, CHEN Haoliang, ZHANG Bo, WU Lijuan, WU Weigang (84)
Low power mapping based on improved genetic algorithm with Prim initial population selection for 3D network-on-chip	SONG Guozhi, WANG Cheng, TU Yao, ZHANG Dakun (90)
Antenna down-tilt angle self-optimization method based on particle swarm in long term evolution network	LIAN Xiaocan, ZHANG Pengyuan, TAN Guoping, LI Yueheng (97)
Quasi-optimal period computation model for hierarchical checkpoint protocol	LYU Hongwu, GU Lei, WANG Huiqiang, ZOU Shichen, FENG Guangsheng (103)
Test case prioritization based on discrete particle swarm optimization algorithm	ZHANG Weixiang, QI Yuhua, LI Dezhi (108)
Real-time online evaluation method of helper thread prefetching quality	ZHANG Jianxun, GU Zhimin (114)
Software protection method based on monitoring attack threats	TANG Zhanyong, LI Zhen, ZHANG Cong, GONG Xiaoqing, FANG Dingyi (120)
Application-layer DDoS defense model based on Web behavior trajectory	LIU Zeyu, XIA Yang, ZHANG Yilong, REN Yuan (128)
Early warning method for driving safety based on CUDA	ZHAO Yongtao, CHEN Qingkui, FANG Yuling, ZHAO Deyu, JI Lina (134)
M-TAEDA: temporal abnormal event detection algorithm for multivariate time-series data of water quality	MAO Yingchi, QI Hai, JIE Qing, WANG Longbao (138)
Real-time crowd counting method from video stream based on GPU	JI Lina, CHEN Qingkui, CHEN Yuanjing, ZHAO Deyu, FANG Yuling, ZHAO Yongtao (145)
Stream computing system for monitoring copy plate vehicles	QIAO Tong, ZHAO Zhuofeng, DING Weilong (153)

Design of remote wireless monitoring system for smart home based on Internet of things
..... DENG Yun, LI Chaoqing, CHEN Xiaohui (159)

Near field communication-enabled water meter system with mobile payment
..... ZHANG Chengyu, WANG Rangding, YAO Ling, FU Songyin, ZUO Fuqiang, GAO Qifei, JIANG Ming (166)

Smart wireless water meter reading system for multi-story residential buildings
..... FU Songyin, WANG Rangding, YAO Ling, ZHANG Chengyu, SHAN Guanmin, HU Guowei (170)

Analysis algorithm of electroencephalogram signals for epilepsy diagnosis based on power spectral density and
limited penetrable visibility graph WANG Ruofan, LIU Jing, WANG Jiang, YU Haitao, CAO Yibin (175)

Network and communications

Dynamic sampling method for wireless sensor network based on compressive sensing
..... SONG Yang, HUANG Zhiqing, ZHANG Yanxin, LI Mengjia (183)

Survey on construction of measurement matrices in compressive sensing
..... WANG Qiang, ZHANG Peilin, WANG Huaiguang, YANG Wangcan, CHEN Yanlong (188)

Block-sparse adaptive filtering algorithm based on inverse hyperbolic sine function against impulsive interference
..... WEI Dandan, ZHOU Yi, SHI Liming, LIU Hongqing (197)

Cyber security

Information hiding method based on Have messages in BitTorrent protocol GAO Bin, ZHAI Jiangtao, DAI Yuewei (200)

Spam detection model of campus network based on incremental learning algorithm
..... CHEN Bin, DONG Yizhou, MAO Mingrong (206)

Time-based strategy audit scheme of access control list in multi-layer firewall
..... WANG Xudong, CHEN Qingping, LI Wen, ZHANG Xinming (212)

Hybrid algorithm for identifying error signatures in hierarchical identity based cryptography batch verification
..... XU Guoyu, WANG Yingfeng, MA Xiaofei, WANG Kefeng, YAN Ruoyu (217)

Artificial intelligence

Incremental formation of concept lattice based on intent waned value WU Jie, LIANG Yan, MA Yuan (222)

Automatic image annotation method using multi-label learning convolutional neural network
..... GAO Yaodong, HOU Lingyan, YANG Dali (228)

Agriculture-related product name extraction and category labeling based on ontology and conditional random field
..... HUANG Nian’e, HUANG He, WANG Rujing (233)

Application of chaos cuckoo search algorithm in harmonic estimation
..... NIU Haifan, SONG Weiping, NING Aiping, MA Yiyuan (239)

Computer vision and virtual reality

Polarimetric synthetic aperture radar feature analysis and classification based on multi-layer support vector machine classifier
..... SONG Chao, XU Xin, GUI Rong, XIE Xinfang, XU Feng (244)

Gesture segmentation and positioning based on improved depth information LIN Haibo, WANG Shengbin, ZHANG Yi (251)

Object recognition method based on RGB-D image kernel descriptor LUO Jian, JIANG Min (255)

3D face modeling and validation in cross-pose face matching LI Xinxin, GONG Xun (262)

Single image in-depth dehazing algorithm based on optimization of guided image
..... DONG Yufei, YANG Yan, CAO Biting (268)

Improved ellipse fitting algorithm based on Letts criterion CAO Junli, LI Jufeng (273)

Frontier & interdisciplinary applications

Knowledge driven automatic annotating algorithm for game strategies
..... CHEN Huanhuan, CHEN Xiaohong, RUAN Tong, GAO Daqi, WANG Haofen (278)

Real-time traffic accident prediction based on AdaBoost classifier ZHANG Jun, HU Zhenbo, ZHU Xinshan (284)

Ultra wideband indoor localization based on inner triangle centroid algorithm
..... WEI Pei, JIANG Ping, HE Jingjing, ZHANG Huimeng (289)

Design of iterative learning controller for systems with random noise XIA Hao, ZHANG Lijie (294)

Dynamic estimation about service time of flight support based on Bayesian network
..... XING Zhiwei, TANG Yunxiao, LUO Qian (299)

《计算机应用》第十届编辑委员会名单

The 10th Editorial Board of Journal of Computer Applications

主 编 Editor-in-chief	张景中 ZHANG Jingzhong		
副 主 编 Associate Editor-in-chief	夏朝晖 XIA Zhaohui		
顾问委员 Advisors (以姓氏笔画为序)			
丁秋林 DING Qiulin	刘锦德 LIU Jinde	杨 路 YANG Lu	吴中福 WU Zhongfu
邱玉辉 QIU Yuhui	何积丰 HE Jifeng	陈 静 CHEN Jing	陈国良 CHEN Guoliang
周巢尘 ZHOU Chaochen	唐泽圣 TANG Zesheng	潘云鹤 PAN Yunhe	

常务委员 Standing Committee Members (以姓氏笔画为序)

王国胤 WANG Guoyin	王晓京 WANG Xiaojing	王宽全 WANG Kuanquan	王瀚漓 WANG Hanli
田 捷 TIAN Jie	付忠良 FU Zhongliang	冯 丹 FENG Dan	冯 勇 FENG Yong
尼玛扎西 Nyima Tashi	齐 勇 QI Yong	江晓波 JIANG Xiaobo	汤 庸 TANG Yong
孙仕亮 SUN Shiliang	孙利民 SUN Limin	李天瑞 LI Tianrui	李战怀 LI Zhanhuai
李晓维 LI Xiaowei	肖 斌 XIAO Bin	吴 跃 WU Yue	何炎祥 HE Yanxiang
余志文 YU Zhiwen	张 军 ZHANG Jun	张 蕾 ZHANG Lei	张敏灵 ZHANG Minling
张道强 ZHANG Daoqiang	陈 斌 CHEN Bin	陈恩红 CHEN Enhong	陈雷霆 CHEN Leiting
范平志 FAN Pingzhi	周 涛 ZHOU Tao	周志华 ZHOU Zhihua	周尚波 ZHOU Shangbo
周傲英 ZHOU Aoying	周激流 ZHOU Jiliu	赵永涛 ZHAO Yongtao	钟 勇 ZHONG Yong
洪西进 HONG Xijin	姚绍文 YAO Shaowen	秦志光 QIN Zhiguang	耿卫东 GENG Weidong
唐常杰 TANG Changjie	黄健斌 HUANG Jianbin	章 毅 ZHANG Yi	彭宇新 PENG Yuxin
潘 伟 PAN Wei	潘爱民 PAN Aimin		

计算机应用

Jisuanji Yingyong

(月刊 1981年创刊)

第37卷 第1期(总第317期) 2017年1月

Journal of Computer Applications

(Monthly, Started in 1981)

Vol.37 No.1(Series No.317) Jan. 2017

主 办	四川省计算机学会 中国科学院成都分院	Sponsored by	Sichuan Computer Federation Chengdu Branch, Chinese Academy of Sciences
主 管	四川省科学技术协会	Superintended by	Sichuan Association for Science and Technology
主 编	张景中	Editor-in-chief	ZHANG Jingzhong
编 辑	《计算机应用》编辑部	Edited by	Editorial Office of Journal of Computer Applications
通信地址	成都市人民南路四段9号 (610041)	Address	No. 9, 4th Section of South Renmin Road, Chengdu 610041, China
电 话	(028) 85224283	Telephone	(028) 85224283
传 真	(028) 85222239-816	Fax	(028) 85222239-816
电子信箱	bjb@joca.cn	E-mail	bjb@joca.cn
网 址	www.joca.cn	Web site	www.joca.cn
出 版	四川计算机应用杂志社有限公司	Published by	Sichuan Computer Applications Press Co., Ltd.
出版日期	2017年1月10日	Publication Date	Jan. 10, 2017
印刷装订	成都蜀通印务有限责任公司	Printed by	Chengdu Shutong Printing Co., Ltd.
国内发行	四川省报刊发行局	Distributed by	Sichuan Bureau for Distribution of Newspapers and Journals
订 购 处	全国各地邮局	Domestic	All Local Post Offices in China
国外发行	中国国际图书贸易总公司 (北京399信箱 100044)	Foreign	China International Book Trading Corporation (P. O. Box 399, Beijing 100044, China)

中国标准连续出版物号 ISSN 1001-9081
CN 51-1307/TP

广告经营许可证号 5100004001023

国外发行代号 M4616

国内邮发代号 62-110

定 价 33.00元/册

ISSN 1001-9081



9 771001 908176