



ISSN 1000-3428  
CN 31-1289/TP  
CODEN JISGEV

计算机工程 (月刊)

# 计算机工程

## Computer Engineering

www.ecice06.com

第47卷 第8期 2021年8月15日  
Vol.47 No.8 15 August 2021

2021 8

■ 北大中文核心期刊 ■ 中科院CSCD核心期刊 ■ 中国科技核心期刊 ■ RCCSE中国核心学术期刊 ■ 工业和信息化部精品期刊

第47卷 第8期 2021年8月15日

www.ecice06.com



华东计算技术研究所 主办  
上海市计算机学会

# 计算机工程 (月刊)

Jisuanji Gongcheng

第 47 卷 第 8 期 2021 年 8 月 15 日

## 目 次

### • 热点与综述 •

- 深度学习的轻量化神经网络结构研究综述 ..... 王 军,冯孙铨,程 勇 ( 1 )
- 改进 Fast-HotStuff 区块链共识算法 ..... 李启南,薛志浩,张学军 ( 14 )
- 基于改进 RRT-Connect 算法的移动机器人路径规划 ..... 黄壹凡,胡立坤,薛文超 ( 22 )
- 车联网中协作数据分发方案研究 ..... 林 峰,丁鹏举,梁吉申,罗铨文,蒋建春 ( 29 )
- MEC 中卸载决策与资源分配的深度强化学习方法 ..... 杨 天,杨 军 ( 37 )

### • 人工智能与模式识别 •

- 面向对比序列模式发现的独立精确置换检验算法 ..... 吴 军,欧阳艾嘉,张 琳 ( 45 )
- 基于网络表示学习与深度学习的推荐算法研究 ..... 刘 峰,王宝亮,潘文采 ( 54 )
- 基于分段特征及自适应加权的 DTW 相似性度量 ..... 刘苗苗,周从华,张 婷 ( 62 )
- 基于注意力机制与改进 TF-IDF 的推荐算法 ..... 李昆仑,于志波,翟利娜,赵佳耀 ( 69 )
- 基于 BERT 的电机领域中文命名实体识别方法 ..... 顾亦然,霍建霖,杨海根,卢逸飞,郭玉雯 ( 78 )
- 基于社区结构的复杂网络鲁棒性优化策略 ..... 刘迪洋,张 震,张 进 ( 84 )
- 基于类邻域字典的线性回归文本分类 ..... 武 娇,洪彩凤,顾永春,顾兴全,金世举 ( 93 )

### • 先进计算与数据处理 •

- GPU 在缪子快速模拟中的应用 ..... 易培淮,李卫东,林 韬,邹佳恒,邓子艳,刘 言 ( 100 )
- 注意力流网络中节点影响力的层级性研究 ..... 李 勇,董思秀,张 强,程方颀,王常青 ( 109 )
- 基于共享最近邻的密度自适应邻域谱聚类算法 ..... 葛君伟,杨广欣 ( 116 )
- 基于协调器与遗传算法的云存储数据复制策略 ..... 魏秀然,王 峰 ( 124 )
- 面向异构架构的传递闭包并行算法 ..... 肖 汉,郭宝云,李彩林,周清雷 ( 131 )

### • 网络空间安全 •

- 基于侧信道特征的安全代理流量分类方法 ..... 高 平,广 晖,陈 熹,李光松 ( 140 )
- 适用于 PLC 的时间基一次性密码方案 ..... 包致婷,柯俊明,杨 铮,龙 华,黄 东 ( 149 )

基于决策树的SM4分组密码工作模式识别 .....	纪文桃,李媛媛,秦宝东(157)
基于模型间迁移性的黑盒对抗攻击起点提升方法 .....	陈晓楠,胡建敏,张本俊,陈爱玲(162)
基于垂线的WSN基站位置隐私保护算法 .....	于吉喆,白乐强,曹科研(170)
针对KASLR的Linux计时攻击方法 .....	丛 眸,张 平,王 宁(177)
<b>• 移动互联网与通信技术 •</b>	
无人机协助的多用户MIMO毫米波网络混合预编码方案 .....	纪澎善,贾向东,路 艺,敬乐天(183)
高铁旅客认知频谱共享算法研究 .....	陈彦铭,谢健骊,张 奎(189)
不完全SIC下CR-NOMA系统的功率分配算法 .....	周 烁,仇润鹤(195)
基于穿墙信道状态信息的行为识别方法 .....	蒙倩霞,余 江,常 俊,浦 钰,陈 澄(201)
毫米波微波网络基于匹配算法的小区关联方法 .....	杨海竹,孙长印,吴维超,徐文军(210)
<b>• 图形图像处理 •</b>	
基于深度学习的物体点云六维位姿估计方法 .....	李少飞,史泽林,庄春刚(216)
自适应窗隔匹配与深度学习相结合的RGB-D SLAM算法 .....	余东应,刘桂华,曾维林,冯 波,张文凯(224)
基于YOLO的多模态加权融合行人检测算法 .....	施 政,毛 力,孙 俊(234)
融合人眼特征与深度学习的疲劳驾驶检测模型 .....	樊 星,刘占文,林 杉,窦瑞娟(243)
基于改进特征金字塔网络的人体姿态估计 .....	王柳程,欧阳城添,梁 文(251)
基于小样本学习和语义信息的图像描述模型 .....	王会勇,卢 超,张晓明(260)
基于单幅图像学习的生成对抗网络模型 .....	朱海琦,李 宏,李定文(271)
<b>• 开发研究与工程应用 •</b>	
接触式传感器测量软体驱动器角度的数据融合 .....	刘艳红,豆园林,任海川,曹桂州(277)
轨道交通控制软件中基于场景的需求分析方法 .....	闫倩倩,缪炜恺(284)
基于改进Faster R-CNN的垃圾检测与分类方法 .....	马 雯,于 炯,王 潇,陈嘉颖(294)
基于先验知识的航拍绝缘子检测方法 .....	宋万潼,李冰锋,费树岷(301)
基于空间通道挤压激励模块的肝硬化识别 .....	王 倩,赵希梅(308)
基于PCA与权重贝叶斯的工作面煤与瓦斯突出预测 .....	阎 馨,朱永浩,屠乃威,吴书文,王雨虹(315)

# Computer Engineering (Monthly)

Vol.47 No.8 15 August 2021

## Contents

### • Research Hotspots and Reviews •

- Survey of Research on Lightweight Neural Network Structures for Deep Learning..... WANG Jun, FENG Suncheng, CHENG Yong ( 1 )
- Improved Fast-HotStuff Blockchain Consensus Algorithm ..... LI Qinan, XUE Zhihao, ZHANG Xuejun ( 14 )
- Mobile Robot Path Planning Based on Improved RRT-Connect Algorithm ..... HUANG Yifan, HU Likun, XUE Wenchao ( 22 )
- Research on Collaborative Data Distribution Scheme in Internet of Vehicles .....  
..... LIN Feng, DING Pengju, LIANG Jishen, LUO Chengwen, JIANG Jianchun ( 29 )
- Deep Reinforcement Learning Method of Offloading Decision and Resource Allocation in MEC ..... YANG Tian, YANG Jun ( 37 )

### • Artificial Intelligence and Pattern Recognition •

- Independent Exact Permutation Testing Algorithm for Distinguishing Sequential Pattern Discovery .....  
..... WU Jun, OUYANG Aijia, ZHANG Lin ( 45 )
- Research on Recommendation Algorithm Based on Network Representation Learning and Deep Learning .....  
..... LIU Feng, WANG Baoliang, PAN Wencai ( 54 )
- DTW Similarity Measure Based on Segmentation Features and Adaptive Weighting ... LIU Miaomiao, ZHOU Conghua, ZHANG Ting ( 62 )
- Recommendation Algorithm Based on Attention Mechanism and Improved TF-IDF .....  
..... LI Kunlun, YU Zhibo, ZHAI Lina, ZHAO Jiayao ( 69 )
- BERT-Based Chinese Named Entity Recognition Method in Motor Field .....  
..... GU Yiran, HUO Jianlin, YANG Haigen, LU Yifei, GUO Yuwen ( 78 )
- Robustness Optimization Strategy Based on Community Structure for Complex Network ... LIU Diyang, ZHANG Zhen, ZHANG Jin ( 84 )
- Linear Regression Text Classification Based on Class-wise Nearest Neighbor Dictionary .....  
..... WU Jiao, HONG Caifeng, GU Yongchun, GU Xingquan, JIN Shiju ( 93 )

### • Advanced Computing and Data Processing •

- Application of GPU in Fast Muon Simulation ..... YI Peihuai, LI Weidong, LIN Tao, ZOU Jiaheng, DENG Ziyang, LIU Yan (100)
- Research on the Hierarchy of Node Influence in Attention Flow Network .....  
..... LI Yong, DONG Sixiu, ZHANG Qiang, CHENG Fangqi, WANG Changqing (109)
- Spectral Clustering Algorithm for Density Adaptive Neighborhood Based on Shared Nearest Neighbors .....  
..... GE Junwei, YANG Guangxin (116)
- Data Replication Strategy of Cloud Storage Based on Coordinator and Genetic Algorithm ..... WEI Xiuran, WANG Feng (124)
- Parallel Transitive Closure Algorithm for Heterogeneous Architecture ..... XIAO Han, GUO Baoyun, LI Cailin, ZHOU Qinglei (131)

• **Cyberspace Security** •

Traffic Classification Method Based on Side-Channel Features for Security Proxy ..... GAO Ping, GUANG Hui, CHEN Xi, LI Guangsong (140)

Time-based One-Time Password Scheme for PLC ..... BAO Zhiting, KE Junming, YANG Zheng, LONG Hua, HUANG Dong (149)

Working Mode Recognition for SM4 Block Cipher Based on Decision Tree ..... JI Wentao, LI Yuanyuan, QIN Baodong (157)

Black Box Adversarial Attack Starting Point Promotion Method Based on Mobility Between Models ..... CHEN Xiaonan, HU Jianmin, ZHANG Benjun, CHEN Ailing (162)

Perpendicular-Based Algorithm for the Protection of Sink Location Privacy in WSN ..... YU Jizhe, BAI Leqiang, CAO Keyan (170)

Method of Timing Attack for Linux Against KASLR ..... CONG Mou, ZHANG Ping, WANG NING (177)

• **Mobile Internet and Communication Technology** •

Hybrid Precoding Scheme of UAV-Assisted Multi-User MIMO Millimeter Wave Network ..... JI Pengshan, JIA Xiangdong, LU Yi, JING Letian (183)

Research on Cognitive Spectrum Sharing Algorithm for High-Speed Railway Passengers ..... CHEN Yanming, XIE Jianli, ZHANG Lei (189)

Power Allocation Algorithm of CR-NOMA System Under Imperfect SIC ..... ZHOU Shuo, QIU Runhe (195)

Behavior Recognition Method Based on Channel State Information in Through-the-Wall ..... MENG Qianxia, YU Jiang, CHANG Jun, PU Yu, CHEN Cheng (201)

Cell Association Method Based on the Matching Algorithm for Millimeter-Wave Networks ..... YANG Haizhu, SUN Changyin, WU Weichao, XU Wenjun (210)

• **Graphics and Image Processing** •

Deep Learning-Based 6D Object Pose Estimation Method from Point Clouds ..... LI Shaofei, SHI Zelin, ZHUANG Chungang (216)

RGB-D SLAM Algorithm Combining Adaptive Window Interval Matching and Deep Learning ..... YU Dongying, LIU Guihua, ZENG Weilin, FENG Bo, ZHANG Wenkai (224)

YOLO-Based Multi-Modal Weighted Fusion Pedestrian Detection Algorithm ..... SHI Zheng, MAO Li, SUN Jun (234)

Fatigue Driving Detection Model Fusing with Human Eye Features and Deep Learning ..... FAN Xing, LIU Zhanwen, LIN Shan, DOU Ruijuan (243)

Human Pose Estimation Based on Improved Pyramid Feature Network ..... WANG Liucheng, OUYANG Chengtian, LIANG Wen (251)

Image Caption Model Based on Few-Shot Learning and Semantic Information ..... WANG Huiyong, LU Chao, ZHANG Xiaoming (260)

Generative Adversarial Network Model Based on Single Image Learning ..... ZHU Haiqi, LI Hong, LI Dingwen (271)

• **Development Research and Engineering Application** •

Data Fusion of Contact Sensors for Soft Actuator Angle Measurement ..... LIU Yanhong, DOU Yuanlin, REN Haichuan, CAO Guizhou (277)

Scenario-based Requirement Analysis Method for Railway Control Software ..... YAN Qianqian, MIAO Weikai (284)

Garbage Detection and Classification Method Based on Improved Faster R-CNN ..... MA Wen, YU Jiong, WANG Xiao, CHEN Jiaying (294)

Prior Knowledge-Based Insulator Detection Method Using Aerial Images ..... SONG Wantong, LI Bingfeng, FEI Shumin (301)

Liver Cirrhosis Recognition Based on Spatial Channel Squeeze Excitation Module ..... WANG Qian, ZHAO Ximei (308)

Prediction of Coal and Gas Outburst in Mine Working Face Based on PCA and Weighted Bayesian ..... YAN Xin, ZHU Yonghao, TU Naiwei, WU Shuwen, WANG Yuhong (315)