



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48卷 第2期 2022年2月15日

Vol.48 No.2 15 February 2022

2022 2

■北大中文核心期刊 ■中科院CSCD来源期刊 ■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48卷 第2期 2022年2月15日

www.ecice06.com



华东计算技术研究所
上海市计算机学会 主办

万方数据

计算机工程(月刊)

Jisuanji Gongcheng

第48卷 第2期 2022年2月15日

目 次

· 热点与综述 ·

- 基于深度学习的垃圾分类方法综述 李金玉,陈晓雷,张爱华,李 策,林冬梅 (1)
基于机器学习的用户与实体行为分析技术综述 崔景洋,陈振国,田立勤,张光华 (10)
一种基于区块链可验证的加密图像检索方案 彭红艳,李 杰,石贞奎,李先贤 (25)
基于图注意力网络的方面级别文本情感分析 施荣华,金 鑫,胡 超 (34)
基于四元数胶囊网络的知识图谱补全模型 陈 恒,王思懿,李冠宇,祁瑞华,杨 晨,王维美 (40)

· 人工智能与模式识别 ·

- 基于多特征实体消歧的中文知识图谱问答 张鹏举,贾永辉,陈文亮 (47)
基于改进多嵌入空间的实时语义数据流推理 高 峰,姚光涛,顾进广 (55)
基于层次聚类的生物网络全局比对算法 田盼盼,陈 璟 (65)
一种基于群等变卷积的度量元学习算法 吴鹏翔,李凡长 (72)
连续时间区间内的频繁词序列挖掘算法 王 璐,刘晓清,何震瀛 (79)
基于深度学习的稀疏矩阵向量乘运算性能预测模型
..... 曹中潇,冯仰德,王 珏,闵维潇,姚铁锤,高 岳,王丽华,高付海 (86)
一种深度回声状态网络的输入尺度自适应算法 刘 鹏,叶 润,闫 斌,谢 茜,刘 睿 (92)
基于变分自编码器的谣言立场分类算法 郭奉琦,孟凡荣,王志晓 (99)
基于最佳子策略记忆的强化探索策略 周瑞朋,秦 进 (106)
基于文本分类的 Fisher Score 快速多标记特征选择算法 汪正凯,沈东升,王晨曦 (113)
基于预训练语言模型的关键词感知问题生成 于尊瑞,毛震东,王 泉,张勇东 (125)

· 网络空间安全 ·

- 抗板级物理攻击的持久存储方法研究 李 闽,张倩颖,王国辉,施智平,关 永 (132)
一种拟态存储元数据随机性问题解决方法 杨 珂,张 帆,郭 威,赵 博,穆 清 (140)

基于历史查询概率的K-匿名哑元位置选取算法 杨洋,胡晓辉,杜永文 (147)

两类非线性密码组件可重构研究与电路设计 连宜新,陈韬,李伟,南龙梅 (156)

基于数据库驱动认知无线电网络的位置隐私保护方案 徐鑫,温蜜 (164)

• 图形图像处理 •

融合改进FPN与关联网络的Faster R-CNN目标检测 汪常建,丁勇,卢盼成 (173)

基于多通道注意力机制的人脸替换鉴别 武茜,贾世杰 (180)

多成本融合的立体匹配网络 张锡英,王厚博,边继龙 (186)

基于自注意力胶囊网络的伪造人脸检测方法 李柯,李邵梅,吉立新,刘硕 (194)

联合语义分割与注意力机制的行人再识别模型 周东明,张灿龙,唐艳平,李志欣 (201)

基于单目和双目视觉信息的全参考立体图像质量评价模型 王宽,杨环,潘振宽,司建伟 (207)

基于多流网络一致性的视频显著性检测 宋佳,陈程立诏 (215)

一种轻量级多尺度融合的图像篡改检测算法 吴旭,刘翔,赵静文 (224)

基于表观的归一化坐标系分类视线估计方法 戴忠东,任敏华 (230)

结合双语义数据增强与目标定位的细粒度图像分类 谭润,叶武剑,刘怡俊 (237)

融合深度学习与成像模型的水下图像增强算法 陈学磊,张品,权令伟,易超,鹿存跃 (243)

面向视觉问答的多模块协同注意模型 邹品荣,肖锋,张文娟,张万玉,王晨阳 (250)

基于反馈机制的图像超分辨率重建算法 楼鑫杰,李小薪,刘志勇 (261)

• 开发研究与工程应用 •

基于EM路由算法的医学图像分割UCaps网络 王文欣,贺煜航,陈刚 (268)

基于HAGA的D2D-NOMA资源分配优化算法 宋勇春,王茜竹,高正念 (275)

基于改进语音处理的卷积神经网络中文语音情感识别方法 乔栋,陈章进,邓良,屠程力 (281)

基于双重注意力机制和GRU网络的短期负荷预测模型 李晓,卢先领 (291)

基于候客点规划的空闲出租车路线推荐算法 陈冬梅,卜霄菲,黄河,杜扬,高国举,孙玉娥 (297)

基于有向图模型的旅游领域命名实体识别 崔丽平,古丽拉·阿东别克,王智悦 (306)

融入双注意力的高分辨率网络人体姿态估计 罗梦诗,徐杨,叶星鑫 (314)

Computer Engineering (Monthly)

Vol.48 No.2 15 February 2022

Contents

• Research Hotspots and Reviews •

Survey of Garbage Classification Methods Based on Deep Learning ··· LI Jinyu, CHEN Xiaolei, ZHANG Aihua, LI Ce, LIN Dongmei (1)

Overview of User and Entity Behavior Analytics Technology Based on Machine Learning ······ CUI Jingyang, CHEN Zhenguo, TIAN Liqin, ZHANG Guanghua (10)

A Blockchain-based Verifiable Encrypted Image Retrieval Scheme ······ PENG Hongyan, LI Jie, SHI Zhenkui, LI Xianxian (25)

Aspect-Level Text Emotion Analysis Based on Graph Attention Network ······ SHI Ronghua, JIN Xin, HU Chao (34)

Knowledge Graph Completion Model Based on Quaternion Capsule Network ······ CHEN Heng, WANG Sivi, LI Guanyu, OI Ruihua, YANG Chen, WANG Weimei (40)

• Artificial Intelligence and Pattern Recognition •

Chinese Knowledge Based Question Answering Based on Multi-feature Entity Disambiguation	ZHANG Pengju, JIA Yonghui, CHEN Wenliang (47)
Real-Time Semantic Data Flow Reasoning Based on Improved Multi-Embedding Space ...	GAO Feng, YAO Guangtao, GU Jinguang (55)
Global Biological Network Alignment Algorithm Based on Hierarchical Clustering	TIAN Panpan, CHEN Jing (65)
A Metric Meta-Learning Algorithm Based on Group Equivariant Convolution	WU Pengxiang, LI Fanzhang (72)
Frequent Word Sequence Mining Algorithm in Continuous Time Interval	WANG Lu, LIU Xiaoqing, HE Zhenying (79)
Computing Performance Prediction Model for Sparse Matrix Vector Multiplication Based on Deep Learning	CAO Zhongxiao, FENG Yangde, WANG Jue, MIN Weixiao, YAO Tiechui, GAO Yue, WANG Lihua, GAO Fuhai (86)
An Adaptive Algorithm of Input Scale for Deep Echo State Networks	LIU Peng, YE Run, YAN Bin, XIE Qian, LIU Rui (92)
Rumor Stance Classification Algorithm Based on Variational Auto-Encoder	GUO Fengqi, MENG Fanrong, WANG Zhixiao (99)
Reinforcement Exploration Strategy Based on Best Sub-Strategy Memory	ZHOU Ruipeng, QIN Jin (106)
Fisher Score Fast Multi-Label Feature Selection Algorithm Based on Text Classification	WANG Zhengkai, SHEN Dongsheng, WANG Chenxi (113)
Keyword Aware Question Generation Based on Pre-Trained Language Model	

• Cyberspace Security •

Research on Persistent Storage Method Against Board-Level Physical Attacks LI Min, ZHANG Qianying, WANG Guohui, SHI Zhiping, GUAN Yong (132)

A Method for Solving the Metadata Randomness Problem of Mimic Storage YANG Ke, ZHANG Fan, GUO Wei, ZHAO Bo, MU Qing (140)

The K-Anonymous Dummy Location Selection Algorithm Based on Historical Query Probability YANG Yang, HU Xiaohui, DU Yongwen (147)

Reconfigurable Research and Circuit Design of Two Types of Nonlinear Cryptographic Components	LIAN Yixin, CHEN Tao, LI Wei, NAN Longmei (156)
---	---

Location Privacy Protection Scheme Based on Database-Driven Cognitive Radio Network	XU Xin, WEN Mi (164)
---	----------------------

• Graphics and Image Processing •

Object Detection Using Faster R-CNN Combining Improved FPN and Relation Network	WANG Changjian, DING Yong , LU Pancheng (173)
---	---

Face Swapping Detection Based on Multi-Channel Attention Mechanism	WU Qian, JIA Shijie (180)
--	---------------------------

Stereo Matching Network with Multi-Cost Fusion	ZHANG Xiying, WANG Houbo, BIAN Jilong (186)
--	---

Method of Face Forgery Detection Based on Self-Attention Capsule Network	LI Ke, LI Shaomei, JI Lixin, LIU Shuo (194)
--	---

Pedestrian Re-Identification Model Combining Semantic Segmentation and Attention Mechanism	ZHOU Dongming, ZHANG Canlong, TANG Yanping, LI Zhixin (201)
--	---

Full-Reference Model for Stereoscopic Image Quality Assessment Based on Monocular and Binocular Visual Information.....	WANG Kuan, YANG Huan, PAN Zhenkuan, SI Jianwei (207)
---	--

Video Saliency Detection Based on Multi-Stream Network Consistency	SONG Jia, CHEN Chenglizhao (215)
--	----------------------------------

A Lightweight Multiscale Fusion Algorithm for Image Tampering Detection	WU Xu, LIU Xiang, ZHAO Jingwen (224)
---	--------------------------------------

Gaze Estimation Method Using Normalized Coordinate System Classification Based on Apparent	DAI Zhongdong, REN Minhua (230)
--	---------------------------------

Fine-Grained Image Classification Combining Dual Semantic Data Augmentation and Target Location	TAN Run, YE Wujian, LIU Yijun (237)
---	-------------------------------------

Underwater Image Enhancement Algorithm Combining Deep Learning and Image Formation Model	CHEN Xuelei, ZHANG Pin, QUAN Lingwei, YI Chao, LU Cunyue (243)
--	--

Multi-Module Co-Attention Model for Visual Question Answering	ZOU Pinrong, XIAO Feng, ZHANG Wenjuan, ZHANG Wanyu, WANG Chenyang (250)
---	---

Super-Resolution Image Reconstruction Algorithm Based on Feedback Mechanism	LOU Xinjie, LI Xiaoxin, LIU Zhiyong (261)
---	---

• Development Research and Engineering Application •

UCaps Network Based on EM-Routing Algorithm for Medical Image Segmentation	WANG Wenxin, HE Yuhang, CHEN Gang (268)
--	---

D2D-NOMA Resource Allocation Optimization Algorithm Based on HAGA	SONG Yongchun, WANG Qianzhu, GAO Zhengnian (275)
---	--

Method for Chinese Speech Emotion Recognition Based on Improved Speech-Processing Convolutional Neural Network	QIAO Dong, CHEN Zhangjin, DENG Liang, TU Chengli (281)
--	--

Method for Forecasting Short-Term Power Load Based on Dual-Stage Attention Mechanism and Gated Recurrent Unit Network	LI Xiao, LU Xianling (291)
---	----------------------------

Idle Taxi Route Recommendation Algorithm Based on Waiting Point Planning	CHEN Dongmei, BU Xiaofei, HUANG He, DU Yang, GAO Guoju, SUN Yu'e (297)
--	--

Named Entity Recognition in Tourism Based on Directed Graph Model	CUI Liping, Altenbek Gulila, WANG Zhiyue (306)
---	--

Human Pose Estimation Using High Resolution Network with Dual Attention	LUO Mengshi, XU Yang, YE Xingxin (314)
---	--