2021 IEEE 4th International Conference on Computer and **Communication Engineering Technology (CCET 2021)**

Beijing, China 13 – 15 August 2021



IEEE Catalog Number: CFP21R04-POD ISBN:

978-1-6654-4613-6

Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP21R04-POD

 ISBN (Print-On-Demand):
 978-1-6654-4613-6

 ISBN (Online):
 978-1-6654-3890-2

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



Table of Contents

2021 IEEE 4th International Conference on Computer and Communication Engineering Technology (CCET)

Preface	х
Conference Committees	x
Pattern Recognition and Target Detection	
Efficient Faster R-CNN: Used in PCB Solder Joint Defects and Components Detection	1
Fangliang Fan, Baoyu Wang, Gailin Zhu, Jianhua Wu	
Pothole Detection System Using Region-Based Convolutional Neural Network	6
Aaquib Javed, Md. Sayem Mahmud, Md. Takbir Alam, Md. Foysal Bin Ohab, Khandakar	Ratul Ali,
Abdullah Al Jobaer, M. Monir Uddin	
A Human Action Recognition Algorithm in Dynamic Scene of Emergency Rescue	12
Yongmei Zhang, Qian Guo	
A Position-Sensitive Regression Network for Multi-Oriented Scene Text Detection	17
Shuchi He, Zhongyue Chen, Xiaoping Chen	
A Neural Network Based High-Rise Building Block Detection	23
Jie Shu, Yanjie Guan, Renxiang Wang	
A Lightweight YOLOv4 Based SAR Image Ship Detection	28
Li-Qun Zhou, Jin-Chun Piao	
A Breast Cancer CT Image Detection Algorithm Based on Improved Feature Pyramid Network	· 32
Yongmei Zhang, Tong Cheng, Ruiqi Li	
Real-Time Lane Detection Based on a Light-Weight Model in the Wild	36
Xu Chen, Changwei Luo	
A Convolution-Involution Hybrid Framework for Monocular 3D Object Detection	41
Tianze Gao, Yu Li, Xiuqin Han	
Automatic Recognition of Intersections Based on Vehicle Trajectory Turning Points Clustering	48
Lei Gao, Lu Wei, Jian Yang, Jinhong Li	

Gesture Recognition Method Based on Doppler Radar Technology	3
Jingbo Sai, Na Liu, Anyu Yu	
A Locust Recognition Method Based on Graph Convolution Neural Network	3
Yongmei Zhang, Xiaodong Li, Aiyan Wu	
Digital Image Processing and Application	
A Novel Two-stage Prediction Model to Classify Functional Connectivity for Brain Disease Diagnosis 63	3
Gaoxu Xu, Yin Liang	
A Velocity Spectrum Picking Method Based on Detection Fine Tuning Depth Recognition Technology 69	9
Haoyang Ma	
The Method Based on Spectrogram's Image Classification for Chinese Dialect's Tone Recognition 79	5
Hongyan Zhang, Yanmei Shao, Xiaojing Yu, Yingying Jin	
Feature Extraction for Image Matching in Wat Phra Chetuphon Wimonmangklararam Balcony Painting with SIFT Algorithms	
Sathit Prasomphan, Nutnicha Pinngoen	
Multi-task and Multi-scale Face Recognition Based on CNN	5
Lipei Zhang, Chen Li, Xiaoxuan Fan, Shuiming Mo	
Incomplete Maximum Matching Segmentation Based on Semantics	1
Hang Su, Hanqing Zhou, Haixiong Lv, Chunlei Zhang, Xin Ding, Yong Liu	
A Novel Active-Learning Based Residential Area Segmentation Algorithm	3
Junwoo Park, Shaofei Li, Zheng Li, Xin Steven	
An Unsupervised Registration Method for Brain Images Based on Contour Guidance 10	1
Xiaoguo Fei, Huiyan Jiang, Hongyu Pan, Yin Dai	
Chebyshev Pooling: An Alternative Layer for the Pooling of CNNs-Based Classifier	3
Ka-Hou Chan, Giovanni Pau, Sio-Kei Im	
Image Processing of Guqin Score Based on Mathematical Morphology11	1
Gen-Fang Chen	
Soft Computing and Intelligent Computing	
Research on Optimization of GA-BP Algorithm Based on LM	5
Yujie Zhao, Jinhong Li, Pengyu Wang, Weihang Jia	
An Improved Second-Order Lagrange Interpolation Function	Э
Shiqi Zhao, Xuesen Shi, Yuyao Shen, Yongqing Wang	

Mobile Edge Computing Task Offloading Based on ADPSO Algorithm in Multi-user Environment	. 126
Mingliang Wei, Zhaoyuan Liu, Wei Hu, Suiyan Geng, Xiongwen Zhao	
Optimization Query Processing for Multi-tiered Persistent Storage	. 131
Nan Noon Noon, Janusz R. Getta, Tianbing Xia	
Improvement of Subspace Clustering Based on Differential Evolution	. 136
Xi Huang, Yulu Yang	
Efficient Time Series Predicting with Feature Selection and Temporal Convolutional Network	. 141
Xiaoqi Li, Chen Liu, Yiru He	
Human Mobility Prediction Based on DBSCAN and RNN	. 146
Zheng Haifeng, Yan Yajie, Zhang Ningbo	
Lightweight Fire Detection System Using Hybrid Edge-Cloud Computing	. 153
Homam Ahmed, Zhu Jie, Muhammad Usman	
Radar Point Cloud Clustering Method Based on Optimization	. 158
Lulu Shen, Kun Li, Lin Zhu, Xuewei Liu, Liyong Ma	
Dueling Network Architecture for Multi-Agent Deep Deterministic Policy Gradient	. 163
Mengying Zhan, Jinchao Chen, Chenglie Du, Yongqiang Xu	
Named Entity Recognition of Chinese Diabetic Literature by Integrating General Domain Knowledge	. 169
Duochuan Zhang	
Software and Applications	
Formal Definition of Pseudo Code and Mapping Rules to Java Code	. 175
Zheng Shan-shan, Wang Zhi-li	
A Design of Sparse Neural Network Accelerator for Memory Access Optimization	. 180
Yijun Cui, Sheng Ma, Libo Huang, Zuocheng Xing, Yuanhu Cheng	
SpBiSeq: An Early-Stage Fingerprint Generation Method with High Robustness for Encrypted Mobile	
Application Traffic	. 185
Junzheng Shi, Chen Yang, Qingya Yang, Jialin Zhang, Mingxin Cui, Gang Xiong	
ZeroWFuzzer: Target-Oriented Fuzzing for Web Interface of Embedded Devices	. 194
Yan Zheng, Weiyu Dong, Hui Cheng	
Edge Intelligence (EI)-Enabled Malware Internet of Things (IoT) Detection System	. 199
Jingxing Lai, Dongping Hu, Aihua Yin, Lingqing Lu	
SWA: A Novel Page Migration Scheme for Hybrid Memory System	. 203
Na Niu, Xinpeng Li, Fangfa Fu, Fengchang Lai, Bing Yang, Jinxiang Wang	

Jinhai Li, Bin Zhou	. 207
A Novel Model for Automatic Identification of Open Source Software License Terms	. 212
Zhiqiang Wang, Guoqiang Xiao, Zili Zhang, Sheng Wu	
Analysis and Detection of Android Ransomware for Custom Encryption	. 220
Jian Jiao, Haini Zhao, Yong Liu	
Computer and Information Engineering	
It's Time to Confront Fake News and Rumors on Social Media: A Bibliometric Study Based on VOSview	wer
	. 226
Yi Ding, Yajun Wang, Yaqin Wang	
A Causal-Regularity and Deep Learning-Based Conjoint Inference	. 233
Suping Wang, Ligu Zhu	
Region Coverage Path Planning of Multiple Disconnected Convex Polygons Based on Simulated Anne Algorithm	_
Xuecong Chen, Jinchao Chen, Chenglie Du, Yongqiang Xu	
Segment-Level Cross-Modal Knowledge Transfer for Speech Sentiment Analysis	. 243
Sheng Zhang, Jincai Chen, Minglei Li, Taisong Li, Ping Lu, Zhu Wang	
Prediction of Impedance Matching Properties Between SNSPD and Free Space Based on BP Neural Network	. 248
Yuchen Zhao, Jianhua Dou, Yucheng He, Jiahuan Zheng, Jian He, Xiaoli Xi	
A COVID-19 Epidemics Trend Prediction Algorithm Based on LSTM	. 252
Yongmei Zhang, Jie Sun	
Security Mechanism for Digital Car Key	. 257
Feng Luo, Zhaojing Zhang, Yifei Ma, Qiujian Li	
Stable Periodic Frequent Itemset Mining on Uncertain Datasets	. 263
Ruimeng He, Jinchao Chen, Chenglie Du, Yuxin Duan	
Multi Head Self Attention Mechanism Based Multi-scale Spatial-Temporal Mixed Text Classification Me Research	
Lei Shi, Shubo Yang, Lin Wei, Yufei Gao, Zhe Li, Yongcai Tao	
Communication Theory and Technology	
Analysis of TLS Encrypted Communication Behavior Based on Bipartite Graph and Traffic Information Embedding	. 278
Lin Yan, Liehui Jiang, Ruimin Wang	

DQN Algorithm Based on Target Value Network Parameter Dynamic Update	285
Weihang Jia, Jinhong Li, Yujie Zhao	
Compiling Loops with Branches on Static-Scheduling CGRA	290
Baofen Yuan, Leibo Liu, Jianfeng Zhu, Xingchen Man	
Security Analysis and Optimization Methods of LSFR Generating Function for MIFARE Classic CAR	
Yelai Feng, Huaixi Wang, Hongyi Lu, Wei Jin, Nina Shu	
A Link Prediction Algorithm for Weighted Networks Based on Dempster-Shafer Evidence Theory and Multi-features	
Miaomiao Liu, Yang Wang, Jingfeng Guo, Jing Chen, Jinyun Yang, Zhigang Liu	
Telecom Customer Behavior Analysis Using Naïve Bayes Classifier	308
Md. Golam Rabiul Alam, Sajjad Hussain, Md. Mofaqkhayrul Islam Mim, Md Tarikul Islam	
Research on Data Communication Based on Microservice Architecture and Knowledge Graph	313
Wenpeng Gao, Wenhao Zhan, Haoquan Gong, Chao Liu, Kemin Wang, Hai Wang	
High-Dimensional Modulation Superposition NOMA with Non-ideal Channel Estimation	318
Jiyuan Sun, Yang Cao, Jing Xu, Xinyu Zhao, Guangzu Liu, Jun Zou	
Modeling and Analysis of Air-Sea Cross-Domain Communication Network Based on Network Dynam	nics
	323
Shang Zhigang, Liang Xuanzhuo	
A MAC Protocol for Distributed Satellite Network	327
Xiaoyi Xu, Chunhui Wang, Zhonghe Jin	
Security Awareness Scheme of Edge Computing in IoT Systems	332
Wenbin Chen, Yuxin Chen, Yishuo Jiao, Quanchun Liu	
Communication and Signal System	
D2D is Used to Improve MIMO System Gain in 5G Power Communication Networks	336
Xi Song, Le Ma, Yutong Wang, Dou Liu, Zhengrui Bao, Hai Wang	
A Link Quality Estimation Method for Wireless Sensor Networks Based on the Ladder Network	341
Lv Hui, Liu LinLan	
Research on D2D Communication Technology in the 5G Smart Grid Scenario	345
Lidan Wang, Le Ma, Zhengrui Bao, Yuting Hou, Ying Li, Xuyang Wang	
Analysis of the Influence of Time-Varying Factors on LF Ground-Wave Propagation Delay	350
Yurong Pu, Rongshuang Sun, Xiyi Zheng, Xiaoli Xi	

Performance Analysis of IEEE 802.1Qch for Automotive Networks—Compared with IEEE 802.1Qbv	355
Bowen Wang, Feng Luo, Zihao Fang	
Anomaly Detection-Oriented High-Frequency Signal Storage for Diesel Engines	360
He Huang, Bailing Xu, Hao Luo, Haoran Zhuang, Xuewei Liu, Liyong Ma	
Speed Guidance Model in the Vicinity of Intersections Based on Internet of Vehicles	364
Zhe Li, Shubo Yang, Yuchu He, Lei Shi, Lin Wei, Yongcai Tao	
The Optimization of a 5G Inset-fed Patch Antenna Using the Machine Learning Algorithm Surrogate Massisted Differential Evolution for Antenna Synthesis	
Angelica Cordero-Samortin, Jennifer dela Cruz, Zoren Mabunga	
Enhancing Source-Location Privacy in IoT Wireless Sensor Networks Routing	376
Aaesha Alzaabi, Ayesha Aldoobi, Latifa alserkal, Deena Alnuaimi, Mahra Alsuwaidi, Nedal Abab	neh
Non-Invasive Heart and Respiratory Rates Extraction using Frequency-Modulated Continuous-Wave	
Jennifer C. Dela Cruz, Francis Anjo C. Javier, Charlotte C. Puyat, Jonathan C. Ibera	
Electronic Technology and Control System	
Aviation Medical Simulation Training Based on Interactive Technology	387
Lin Jiang, Lijun Wang, Zhengping Li, Sensen Zhao	
Privacy Protection Strategy Based on Federated Learning for Smart Park Multi Energy Fusion System	n
	392
Guanlin Si, Yue Zhang, Yue Sun	
Research and Design of Intelligent Irrigation Control System Based on Fuzzy	396
Liu Sijia, Hu Wenwen, Xu Shipu, Wu Yingjing, Liu Yong, Wang Yunsheng	
Downscaled Correction of Temperature Forecast Algorithm with Encoder-Decoder over the Hengduar Mountains	
Jingwei Meng, Danhong Dong, Wulong Zhang	
Cooperative Task Allocation of Multiple UAVs Based on Greedy Algorithm	408
Yuheng Chen, Jinchao Chen, Chenglie Du, Wenquan Yu	
Research on Setting Voltage of Electrolyzer Based on LGBM-LSTM Algorithm	414
Manshan Lin, Liangcai Ma	
Design and Implementation of Energy Consumption Data Acquisition System of Tram Based on LabV	
Liwei Dong, Dongsheng Yan	
Light Absorption Optimization for Superconducting Nanowire Single-Photon Detector Based on PSO. <i>Yuchen Zhao. Hao Tian. Yucheng He. Jian He. Kun Li. Xiaoli Xi</i>	425

Auth	or Index
Liyuan Cai, Hao Luo, Chen Yao, Lianfang Wang, Liyong Ma	
High Frequency Data Compression for Diesel Engine Monitoring	443
Ruili Jiao, Minsong Huang, Xing Chang	
Phase Recognition of Supercooled Droplet Based on Convolutional Neural Network	439
Wenbin Chen, Yan Zhen, Libin Zheng, Huifeng Bai, Chao Huo, Ganghong Zhang	
An Intelligent Integrated Terminal Based on Edge Computing for Power Distribution and Metering.	434
Hongteng Wang, Lianfang Wang, Liyong Ma	
Anomaly Detection of Hydropower Bearing Based on Convolutional Neural Network Autoencoder.	430