# 2021 3rd International Conference on Advances in Computer **Technology, Information Science** and Communication (CTISC 2021)

Shanghai, China 23 – 25 April 2021



**IEEE Catalog Number: CFP21W93-POD ISBN**:

978-1-6654-4812-3

## 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:
 CFP21W93-POD

 ISBN (Print-On-Demand):
 978-1-6654-4812-3

 ISBN (Online):
 978-1-6654-1868-3

### 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



# 2021 3rd International Conference on Advances in Computer Technology, Information Science and Communication (CTISC) CTISC 2021

### **Table of Contents**

reface xiv
ommittees xveviewers xvii
021 3rd International Conference on Advances in Computer echnology, Information Science and Communication
reliminary Design of Underwater Unmanned Vehicle Integrated System Evaluation .1 Cai Cheng-qi (Jiangsu University of Science and Technology, Zhenjiang City) and Yang Song-lin (Jiangsu University of Science and Technology, Zhenjiang City)
onditional GAN with Effective Attention for SAR-to-Optical Image Translation .7
orrelation between Nitrogen Pollution and WWTPs Discharge in Lake Taihu .12 Ziyang Shan (University of Science and Technology of China, China) and Wenjie Du (University of Science and Technology of China, China)
earching for Similar Binary Code Based on the Influence of Basic Block Vertex .17
redicting the Association between Human Drugs and Targets Based on HeteSim Score .25 Le Wei (Huazhong Agricultural University, China) and Fang Zheng (Huazhong Agricultural University, China)

LGANet: Local Graph Attention Network for Peer-to-Peer Botnet Detection 31
Shannon Capacity under Relative Motion 37
Developing Energy Monitoring Application for Monitoring Power Consumption In Production Machines 42
System Throughput Performances Analyses with Stochastic Geometry in Unlicensed Spectrum Systems 47
Zhiyuan Liu (Beijing University of Posts and Telecommunications, China) and Xiaodong Xu (Beijing University of Posts and Telecommunications, China)
Range-Doppler Imaging for Noise Radar via 2D Generalized Orthogonal Matching Pursuit .53  Xingyu Lu (Nanjing University of Science and Technology, China), Ke  Tan (Nanjing University of Science and Technology, China), Weimin Su (Nanjing University of Science and Technology, China), Hong Gu (Nanjing University of Science and Technology, China), Hailong Zhang (Nanjing Marina Radar Institute, China), and Chao Bo (Nanjing Institute of Electronic Equipment, China)
GCA:A Chord Music Generation Algorithm Based on Double-Layer LSTM .57
Weak Commutativity of Quantum Automata .62 Feidan Huang (Guizhou University of Engineering Science, China) and Fasheng Cao (Guizhou Minzu University, China)
Prosody-Enhanced Mandarin Text-to-Speech System .67.  Fang Niu (Xinjiang University) and Wushour Silamu (Xinjiang University)
Transfer Learning for Encrypted Malicious Traffic Detection Based on Efficientnet .72

SRCV: A Source Routing Based Consistency Verification Mechanism in SDN .77
A Cloud-Based Smart Wide-Area Measurement System for Power Grid Fault Detection .82  Jingsong Shan (Huaiyin Institute of Technology, China), Jianyang Zhao (Huaiyin Institute of Technology, China), Chengfu Sun (Huaiyin Institute of Technology, China), Chunhua Jin (Huaiyin Institute of Technology, China), and Zhenxiu Zhang (Huaiyin Institute of Technology, China)
Improved SSD Algorithm Based on Multi-Scale Feature Fusion and Residual Attention Mechanism 87.  Yongquan Zhao (Xishuangbanna Power Supply Bureau, Yunnan Power Grid Co., Ltd., Xishuangbanna, China)
A Probability-Based Fault Tolerance Strategy for Service-Based Systems .92.  Futian Wang (Anhui University, China), Tao Hong (Anhui University, China), Dechun Wang (Anhui University, China), and Cheng Zhang (Anhui University, China)
Algorithm of Handwritten String Segmentation Based on Recursive Rraining in Background  Domain .98
A Weighted Routing Protocol for Airborne Ultraviolet Communication Network Based on Link State Perception 103
MDACD: A Model-Driven Development Method for Avionics Software Components 107
A Novel Incentive Mechanism Based on Repeated Game in Fog Computing .112

WiPass: PIN-Free and Device-Free User Authentication Leveraging Behavioral Features via WiFi Channel State Information .120
Inter-Satellite Token Ring Ad hoc Network Technology for Micro-Nano Satellite Cluster Collaboration .125
Optimization of Stator Material and Design of Slot Inclination Angle of Ultrasonic Motors Based on Response Characteristics of Stator Tooth Surface .132
Four Search Method Obtaining the Conjugating Direction Along the Negative Gradient Directions 140  Dongxia Hu (China University of Petroleum(East China), China), Chunming Li (China University of Petroleum(East China), China), and Xiaoli Yin (China University of Petroleum(East China), China)
Design and Simulation of Predictive Based on Fuzzy Logic for Kiln Temperature .145
Study on Evaluation and Optimization of Subway Train Rescue Plan Based on Game Theory and Set Pair Model .150
FDispatcher: Using Flow Director to Accelerate NFV Packet Dispatching .155
A new Unsupervised Algorithm for Extracting Relationship Words between Two Entities .161  Fan Wu (Henan University, China), Taihao Zheng (Henan University, China), Li Yao (Henan University, China), and Honghai Feng (Henan University, China)
Construction of Knowledge Graph of Drug-Action Mechanism 166.  Jie Zhao (Henan University, China), Aiyu Wang (Henan University, China), Fangfang Su (Henan University, China), Yanyan Chen (Henan University, China), and Honghai Feng (Henan University, China)
Machine Learning Product key Performance Indicators and Alignment to Model Evaluation .17.2  Ioannis Bakagiannis (University of Thessaly, Greece), Vassilis C.  Gerogiannis (University of Thessaly, Greece), George Kakarontzas  (University of Thessaly, Greece), and Anthony Karageorgos (University  of Thessaly, Greece)

Community Detection Algorithm for Heterogeneous Networks Based on Central Node and Seed  Community Extension .178
Qichao Peng (National University of Defense Technology, China), Kebin
Chen (National University of Defense Technology, China), Qi Liu
(National University of Defense Technology, China), Yaofeng Su (National University of Defense Technology, China), and Yunjun Lu
(National University of Defense Technology, China)
An Overlapping Community Detection Algorithm for Label Propagation Based on Node Influence 83
Qi Liu (National University of Defense Technology, China), Yaofeng Su
(National University of Defense Technology, China), Qichao Peng
(National University of Defense Technology, China), Kebin Chen
(National University of Defense Technology, China), and Yunjun Lu (National University of Defense Technology, China)
Multi-Factor Load Balancing Algorithm for 5G Power Network Data Center 188
Power Grid Co., Ltd, China), Wen Quan (Yunnan Power Grid Co., Ltd,
China), Fu Cheng (Yunnan Power Grid Co., Ltd, China), and Jiang
Liqiong (Yunnan Power Grid Co., Ltd, China)
A Novel Big Data Cleaning Algorithm Based on Edge Computing In Industrial Internet of Things .194
Mao Chen (Donghua University, China), Wen Chen (Donghua University, China), and Yongqi Zhu (Donghua University, China)
Collaborative Representation Based on the Constraint of Spectral Characteristics for Hyperspectral Anomaly Detection .199
Research and Application of the Mapping Process from Excel Sheet to Dynamic Form 205
Adaptive Equalization for QAM Signals Using Gated Recycle Unit Neural Network .210
A Recognition Algorithm for Signal Modulation Modes of Tactical Data Link .215

The Construction of Wireless Channel Model Visualization Platform Based on Cesium .221  Junming Li (Lanzhou Jiaotong University, China; Gansu Radio Monitoring  and Positioning Industry Technology Center, China) and Tianfeng Yan  (Lanzhou Jiaotong University, China; Gansu Radio Monitoring and  Positioning Industry Technology Center, China)
Research on the Method of Remaining Useful Life Prediction of Lithium-ion Battery Based on LSTM 226.
Yujie Guan (Sichuan University, China) and Jianbo Liu (Sichuan University, China)
Video Compression Artifacts Removal with Efficient Non-Local Block .232
End States Guided Matching Network for Retrieval-Based Multi-Turn Conversation .238
Few-Shot Aircraft Detection Based on Deep Reinforcement Learning .246
Research on Application of Intelligent Analysis in Monitoring of Classroom Teaching .253
mproved K-means Clustering Algorithm by Combining with Multiple Factors .258
A Collaborative Recommendation Model of Agricultural Planting Technology Based on User Characteristics .264
Product Click-Through Rate Prediction Model Integrating Self-Attention Mechanism .269
Apple Leaf Disease Regcognition Method Base on Improved ShuffleNet V2 .27.6
Research on Application of Collaboration Office Automation Technology in Flipped Classroom 283  Yan Zhang (Guangzhou College of Technology and Business, P.R. China)  and Hui Liu (Guangzhou College of Technology and Business, P.R. China)

An Intelligent Customer Service System for Securities Industry Based on Compound Corpus and Text Vector 288.
Runwei Guan (University of Southampton, United Kingdom), Xiaohui Zhu (Xi'an Jiaotong-Liverpool University, China), Fei Pan (University of Southampton, United Kingdom), Yong Yue (Xi'an Jiaotong-Liverpool University, China), Jieming Ma (Xi'an Jiaotong-Liverpool University, China), and Jie Zhang (Xi'an Jiaotong-Liverpool University, China)
Hyperspectral and Panchromatic Image Fusion Based on CNMF 293
Facial Feature Information Based Computer-Aided Emoticon Design System 298.  Chen Zhu (Harbin Institute of Technology; Ministry of Culture and Tourism, China), Wang Yan (Harbin Institute of Technology; Ministry of Culture and Tourism, China), and Si Zheng Ming (Harbin Institute of Technology; Ministry of Culture and Tourism, China)
Pre-Training Convolution Network for Crowd Counting .304.  Shi Ning (Southeast University, NanJing, China) and Shao JiaYu (Southeast University, NanJing, China)
3D Refined Reconstruction for Brushes Based on Multiple Images .309
Underwater Polarized Image Processing Based on Active Illumination and Image Fusion of Circular Polarized Light 315
An Algorithm Based on Attention Mask for Fine-Grained Object Detection .324
An Improved Helmet Detection Method for YOLOv3 on an Unbalanced Dataset .328
Resnet-Based Quality Evaluation of Image Mosaic and Training Data Balance .333
Cross-Modal Attention Network for RGB-T Tracking .341

A Novel Attention-Guided Network for Deep High Dynamic Range Imaging .347	
and Telecommunications, China), and Tangsheng Li (Chongqing University of Posts and Telecommunications, China)	
An Adaptive-Stylization-Based Dynamic Residual-Multi-Stage and Multi-Pooling Approach to Arbitrary Image Style Transfer .353	
Domain Feature Alignment Based on Complement Foreground for Cross-Domain Pedestrian Re-Identification .361	
An Improved Method of CRIMINISI Algorithm .367	
High-Precision Integrated Parameter Calibration Method for Seam Tracker .372	
Low-Quality Video Key Frame Extraction via Affinity Propagation .3.77	
LiDAR and Camera Calibration Using Near-Far Dual Targets .382	
Generalized Image Reconstruction over T-Algebra 387 Liang Liao (Zhongyuan University of Technology, China), Xuechun Zhang (Zhongyuan University of Technology, China), Xinqiang Wang (Zhongyuan University of Technology, China), Sen Lin (Zhongyuan University of Technology, China), and Xin Liu (Yellow River Conservancy Commission, China)	
Application of Structured-Light 3D Reconstruction in Virtual Assembly .393	

Robust Feature Point Detection for Freehand Strokes with Deep Learning Approach .398
Long Zeng (Tsinghua University, China), Xin Zhang (Tsinghua
University, China), Zhi-Kai Dong (Tsinghua University, China), Hong-Yu
Wang (Tsinghua University, China), and Jia-Yi Yu (Tsinghua University,
China)
Jointly Learning Spectral Sensitivity Functions and Demosaicking via Deep Networks .404
Recognition of Air Traffic Controller's Mouth State Based on Deep Convolutional Neural
Network .412
Unsupervised Domain Adaption Based on Metric Learning for Person Re-Identification .417
Author Index 423
Author mack #25