

2020 International Conference on Wireless Communications and Signal Processing (WCSP 2020)

**Nanjing, China
21-23 October 2020**

Pages 1-607



**IEEE Catalog Number: CFP2070H-POD
ISBN: 978-1-7281-7237-8**

**Copyright © 2020 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:	CFP2070H-POD
ISBN (Print-On-Demand):	978-1-7281-7237-8
ISBN (Online):	978-1-7281-7236-1
ISSN:	2325-3746

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

CURRAN ASSOCIATES INC.
proceedings
.com

The 12th International Conference on Wireless Communications and Signal Processing (WCSP 2020) Table of Contents

Conference Committee..... xvii

■ B5G and 6G Symposium

Performance of Covert Surveillance via Proactive Eavesdropping.....	1
<i>Shumin Tu, Jiangbo Si, Zihao Cheng, Lei Guan, Chao Wang</i>	
HARQ Based Joint Uplink-Downlink Optimal Scheduling Strategy for Single-Loop WNCS	7
<i>Zuoyu An, Shaohua Wu, Ying Wang, Jian Jiao, Qinyu Zhang</i>	
Block Compressed Sensing-Based Joint Source-Channel Coding for Wireless Image Transmission.....	13
<i>Leqi Zheng, Tingting Zhu, Xiao Ma</i>	
A 3D Non-stationary Channel Model for 6G Wireless Systems Employing Intelligent Reflecting Surface	19
<i>Yingzhuo Sun, Cheng-Xiang Wang, Jie Huang, Jun Wang</i>	
UAV-UAV Communication Under Malicious Jamming: Trajectory Optimization with Turning Angle Constraint.....	26
<i>Yang Wu, Weiwei Yang, Xinrong Guan</i>	
Multi-task Mapping and Resource Allocation Mechanism in Software Defined Sensor Networks	32
<i>Lishui Chen, Dapeng Wu, Zhidu Li</i>	
Reward Maximization Strategy in Virtualized Wireless Sensor Networks	38
<i>Ailing Zhong, Zhidu Li, Dapeng Wu, Ruyan Wang, Alexander Fedotov, Vladimir Badenko</i>	
A Multiple Base Stations Cooperation Strategy for Downlink Transmission in Cellular and UAV Integrated Networks	44
<i>Zhe Wang, Jun Zheng</i>	
Secure Short-Packet Transmission in Uplink Massive MU-MIMO IoT Networks	50
<i>Tian Yu, Xiaoli Sun, Yueming Cai</i>	
Data-Driven Energy Efficient Predictive Resource Allocation in Internet of Vehicles	56
<i>Na Xue, Haixia Zhang, Chuanting Zhang, Tiantian Li, Dongfeng Yuan</i>	
Analysis and Evaluation of Hash Access for Blockchain Radio Access Networks	62
<i>Bowen Zhang, Xintong Ling, Yuwei Le, Jiaheng Wang, Can Cai, Zerong Tang</i>	

Revenue Analysis of Edge Computing Devices in Blockchain-Based IoT Networks	68
<i>Shuyue Ai, Yuna Jiang, Shuang Zheng, Tao Han, Xiaohu Ge</i>	
Scheduling Optimization for Mixed-Type Devices of IoT in Massive MIMO Systems with Spatio-Temporal Traffic	74
<i>Qi Zhang, Howard H. Yang, Tony Q. S. Quek, Shi Jin</i>	
Multi-UAV Aided Data Collection for Age Minimization in Wireless Sensor Networks	80
<i>Chixiong Mao, Juan Liu, Lingfu Xie</i>	
Optimizing Resource-Efficiency for Federated Edge Intelligence in IoT Networks.....	86
<i>Yong Xiao, Yingyu Li, Guangming Shi, H. Vincent Poor</i>	
A Deep Reinforcement Learning Approach to Energy-Harvesting UAV-Aided Data Collection	93
<i>Ning Zhang, Juan Liu, Lingfu Xie, Peng Tong</i>	
Helium Speech Correction Algorithm Based on Deep Neural Networks	99
<i>Dongmei Li, Shibing Zhang, Lili Guo, Yonghong Chen</i>	
Lightweight Convolutional Neural Network for High-Spatial-Resolution Remote Sensing Scenes Classification	104
<i>Wang Luo, Wenqing Yang, Xian Yu, Ye Wang, Kai Tan</i>	
Delay Optimization Based on Improved Differential Evolutionary Algorithm for Task Offloading in Fog Computing Networks.....	109
<i>Xujie Li, Guangzhao Zhang, Xuedong Zheng, Siyang Hua</i>	
Status Update Performance in Uplink Massive MU-MIMO Short-Packet Communication Systems.....	115
<i>Zeyuan Zhu, Baoquan Yu, Yueming Cai</i>	
Energy Efficient Resource Allocation in NOMA-Sectored Heterogeneous Network.....	120
<i>Lei Wang, Wen Tang, Ting Qi, Jingwu Cui, Baoyu Zheng</i>	
Direction Information Aided Precoding for Aeronautical Communication Systems.....	126
<i>Songkang Huang, Lei Zhao, Ming Jiang, Zichao Ji, Chenlu Zhang</i>	
■ Intelligent Communications and Big Data Symposium	
Unsupervised Image Classification System for Mobile Devices Based on Incremental Isomap.....	131
<i>Tiance Wu, Xinyu Tong, Xiaohua Tian</i>	
Realization of Detection Algorithms for Key Parts of Unmanned Aerial Vehicle Based on Deep Learning.....	137
<i>Guangya Wang, Hanyu Hong, Yaozong Zhang, Jinmeng Wu, Yunfei Wang, Shiyang Li</i>	
Spatial-Time MIMO Autoencoder for Physical Layer	143
<i>Tianjie Mu, Xiaohui Chen, Li Chen, Huarui Yin, Guo Wei</i>	
User Pair-Relay Matching in a Multiple User Pair and Multiple Untrusted Relay Network	149
<i>Rugui Yao, Doudou Song, Lukun Yao, Theodoros A. Tsiftsis, Nikolaos I. Miridakis, Nan Qi, Xiaoya Zuo, Danian Lou</i>	
Angle-of-Arrival Estimation for Vehicle-to-Vehicle Communications Based on Machine Learning	154
<i>Mi Yang, Bo Ai, Ruisi He, Huang Chen, Zhangfeng Ma, Zhangdui Zhong</i>	

The Intelligent Preparation of Scene Matching Guidance Reference Map Based on Prior Knowledge.....	159
<i>Pan Chen, Yaozong Zhang, Jinmeng Wu, Xingxun Li</i>	
Deep Learning-Based Belief Propagation Algorithm over Non-binary Finite Fields.....	164
<i>Ting Liu, Xuechen Chen</i>	
Status Update for Correlated Energy Harvesting Sensors: A Deep Reinforcement Learning Approach.....	170
<i>Nan Zhao, Chao Xu, Shun Zhang, Yiping Xie, Xijun Wang, Hongguang Sun</i>	
Video Sensor Security System in IoT Based on Edge Computing.....	176
<i>Shaolei Jin, Bin Sun, Yusun Zhou, Hongtuo Han, Qiang Li, Chengang Xu, Xinyu Jin</i>	
Deep Learning Based Antenna Selection for Channel Extrapolation in FDD Massive MIMO	182
<i>Yindi Yang, Shun Zhang, Feifei Gao, Chao Xu, Jianpeng Ma, Octavia A. Dobre</i>	
Real Time Air Monitoring, Analysis and Prediction System Based on Internet of Things and LSTM	188
<i>Wenhua Li, Lili Yi, Xiang Yin</i>	
Mean Field Reinforcement Learning Based Anti-Jamming Communications for Ultra-Dense Internet of Things in 6G	195
<i>Ximing Wang, Yuhua Xu, Jin Chen, Chunguo Li, Xin Liu, Dianxiong Liu, Yifan Xu</i>	
Distributed Community Detection on Overlapping Stochastic Block Model	201
<i>Jiasheng Xu, Luoyi Fu, Xiaoying Gan, Bo Zhu</i>	
Distributed Joint Optimization of Deployment, Computation Offloading and Resource Allocation in Coalition-based UAV Swarms	207
<i>Kailing Yao, Yuhua Xu, Jin Chen, Yuping Gong, Yang Yang, Changhua Yao, Zhiyong Du</i>	
Identification and Extraction of Circular Markers in 3D Reconstruction.....	213
<i>Yunfei Wang, Hanyu Hong, Jinmeng Wu, Guangya Wang, Shiyang Li</i>	
Underdetermined Blind Source Separation in Reverberant Environment	217
<i>Shuai Li, Hongqing Liu, Gan Lu, Yi Zhou</i>	
Spectrum Allocation Based on Partially Overlapping and Bonded Channels: A Game-theoretic Learning Approach	222
<i>Yuli Zhang, Han Han, Kailing Yao, Runfeng Chen, Tao Li, Jiajun Bai</i>	
Federated Learning Service Market: A Game Theoretic Analysis.....	227
<i>Lixiao Dong, Yang Zhang</i>	
Privacy is not Free: Energy-Aware Federated Learning for Mobile and Edge Intelligence.....	233
<i>Wenqi Yang, Yang Zhang, Wei Yang Bryan Lim, Zehui Xiong, Yutao Jiao, Jiangming Jin</i>	
Social Bandit Learning: Strangers Can Help.....	239
<i>Jun Zong, Ting Liu, Zhaowei Zhu, Xiliang Luo, Hua Qian</i>	
Delay Optimization with FCFS Queuing Model in Mobile Edge Computing-Assisted UAV Swarms: A Game-Theoretic Learning Approach	245
<i>Runfeng Chen, Li Cui, Yuli Zhang, Jin Chen, Kailing Yao, Yang Yang, Changhua Yao, Han Han</i>	

Traffic Flow Forecasting with Spatial-Temporal Graph Convolutional Networks in Edge-Computing Systems.....	251
<i>Xianlu Xu, Haifeng Zheng, Xinxin Feng, Youjia Chen</i>	
Multi-agent DRL-Based Resource Allocation in Downlink Multi-cell OFDMA System	257
<i>Jing Hu, Xiaoming Wang, Dapeng Li, Youyun Xu</i>	
From Decoupling to Reconstruction: A Robust Graph Neural Network Against Topology Attacks	263
<i>Xiaodong Wei, Yong Li, Xiaowei Qin, Xiaodong Xu, Ximin Li, Mengjie Liu</i>	
Open-Set Interference Signal Recognition Using Boundary Samples: A Hybrid Approach.....	269
<i>Yujie Xu, Xiaowei Qin, Xiaodong Xu, Jianqiang Chen</i>	
Capacity of UAV-Assisted Air-to-Ground Communication with Random Perturbation of UAV Platform.....	275
<i>Jialin Zhu, Zhiqing Wei, Huici Wu, Chen Qiu, Zhiyong Feng</i>	
Joint Computation Offloading and Resource Allocation in UAV Swarms with Multi-access Edge Computing.....	280
<i>Wanning Liu, Yitao Xu, Nan Qi, Kailing Yao, Yuli Zhang, Wenhui He</i>	
Device Scheduling for Energy-Efficient Federated Learning over Wireless Network Based on TDMA Mode.....	286
<i>Youqiang Hu, Hejiao Huang, Nuo Yu</i>	
User Selection Aware Joint Radio-and-Computing Resource Allocation for Federated Edge Learning	292
<i>Yunjie Zuo, Yuan Liu</i>	
Deep Reinforcement Learning-Based Edge Caching in Single-Cell Wireless Networks	298
<i>Rong Wu, Qiang Li, Xiaohu Ge</i>	
Light Weight Automatic Modulation Classification for Edge Devices in Spectrum Sensing Wireless Networks.....	304
<i>Wanli Ma, Bo Zhang, Yuli Zhang, Sudan Han, Jianchao Zheng, Jinlin Peng, Yuhua Tang</i>	
Radio Frequency Fingerprint Based Wireless Transmitter Identification Against Malicious Attacker: An Adversarial Learning Approach	310
<i>Hao Han, Li Cui, Wen Li, Luying Huang, Yuan Cai, Jihao Cai, Yuli Zhang</i>	

Optical Communications Symposium

A Novel Realization of PSK Quantum-Noise Randomized Cipher System Based on Series Structure of Multiple Phase Modulators.....	316
<i>Yeteng Tan, Tao Pu, Jilin Zheng, Hua Zhou, Guorui Su, Huatao Zhu</i>	
Integrated Single Sideband Modulation Based on Sideband Amplification Injection Locking Effect	321
<i>Zhang Xin, Pu Tao, Zheng Jilin, Li Jin</i>	
A Novel Algorithm for Reducing the Power Loss of Routing Paths in ONOCs	325
<i>Hua Yan, Yiyuan Xie, Xiaoping Yang, Tingting Song</i>	
Average Channel Capacity Analysis for Visible Light Communications with Random Receivers.....	331
<i>Xian-Tao Fu, Rong-Rong Lu, Sheng-Hong Lin, Jin-Yuan Wang</i>	
Edge Detection by Superposed-Spiral Phase Filter	337
<i>Zhe Li, Shengmei Zhao, Le Wang, Baoyu Zheng</i>	

A Study of Frequency Down-Converter Based on Period-One Dynamics of the Integrated Lasers.....	342
<i>Xianshuai Meng, Jilin Zheng, Jin Li</i>	
The Research on Aperture Averaging of Modulating Retro-Reflector Optical Communication.....	346
<i>Junquan Hu, Jingyuan Wang, Ke Wang, Zhiyong Xu, Jianhua Li, Jiyong Zhao, Mengtong Xie</i>	
A Low Jitter 50Gb/s PAM4 CDR of Receiver in 40nm CMOS Technology.....	349
<i>Mengshuai Wang, Yingmei Chen, Jinlei Yuan</i>	
Super Gaussian Kernel-Aided Deep Neural Network Equalizer Utilized in Visible Light Transparent Transmission from Free-Space to Fiber.....	353
<i>Qiuyi Lu, Jiang Chen, Yiheng Zhao, Nan Chi</i>	
Numerical Investigation on the Nonlinear Dynamics of the Monolithically Integrated Mutual Injected Semiconductor Laser with Short-Coupled Regime.....	358
<i>Jin Li, Jilin Zheng, Tao Pu, Xin Zhang</i>	
■ Signal Processing for Communications Symposium	
Deep Learning-Based Channel Quality Estimation in Adaptive Shortwave Communication Systems.....	363
<i>Yaru Zhou, Yu Wang, Guan Gui, Haris Gacarin, Hikmet Sari</i>	
Joint 3D Trajectory and Power Optimization for Multiple Antenna Aided NOMA in UAV Networks.....	369
<i>Jie Tang, Wanmei Feng, Qingmiao Zhang, Jun-Hui Ou, Xiuyin Zhang, Junhui Zhao</i>	
Joint Trajectory and Resource Allocation Optimization for Two-Way UAV-Aided Relaying Network.....	376
<i>Yipeng Liang, Lin Xiao, Dingcheng Yang, Keju Lu</i>	
Cooperative Fingerprint Positioning for Cell-Free Massive MIMO Systems.....	382
<i>Jiahua Qiu, Kui Xu, Zhexian Shen</i>	
Single-Channel Blind Source Separation of Two MPSK Signals Based on Stack Algorithm.....	388
<i>Zhongchong Peng, Hui Li</i>	
Capacity Enhancement for NOMA-Based Coordinated Direct and Relay Transmission.....	394
<i>Yao Xu, Bo Li, Gang Wang</i>	
Uplink Analysis of Cell-Free Massive MIMO System Combined with Index Modulation.....	400
<i>Mouhua Huang, Kui Xu, Dongmei Zhang</i>	
Deep Reinforcement Learning for Caching Placement and Content Delivery in UAV NOMA Networks.....	406
<i>Ziduan Wang, Tiankui Zhang, Yuanwei Liu, Wenjun Xu</i>	
Spike and Slab Prior Based Joint Sparse Channel Estimation and Multiuser Detection in MTC Communications.....	412
<i>Xiaoxu Zhang, Li Hao, Jiaqi Liu</i>	
Separating Multi-stream Signals Based on Space-Time Isomerism.....	418
<i>Liang Jin, Yangming Lou, Xiaoming Xu, Zhou Zhong, Hu Wang</i>	

Secure Transmission Design for Dual-Polarized Satellite System via DL-MPWFRFT and Improved Chaotic Phase Modulation.....	424
<i>Haobo Wang, Hang Hu, Xinyu Da, Lei Ni, Yu Pan, Yonghui Xu</i>	
NOMA in Cell-Free mMIMO Systems with AP Selection.....	430
<i>Zhiming Wang, Dongmei Zhang, Kui Xu, Wei Xie, Jianhui Xu, Ximing Li</i>	
Design of Improper Constellations for Optimal Data Rates in Downlink NOMA Systems	436
<i>Hao Cheng, Yili Xia, Zhaohua Lu, Yongming Huang, Wenjiang Pei, Luxi Yang, Danilo P. Mandic</i>	
Three-Dimensional Joint Parameter Estimation Algorithm Based on Service Antenna	442
<i>Yuan She, Xiaolong Yang, Mu Zhou, Zengshan Tian</i>	
Distributed Computational Imaging with Reconfigurable Intelligent Surface.....	448
<i>Yang Tao, Zhaoyang Zhang</i>	
Cross-Layer Data Driven Beam Selection for mmWave Vehicular Communications.....	455
<i>Shichao Wang, Dapeng Li, Haitao Zhao, Xiaoming Wang</i>	
Analysis of Throughput for UAV-Assisted Multi-tier mm-Wave Cellular Heterogeneous Networks.....	461
<i>Yi Lu, Xiangdong Jia, Pengshan Ji, Yaping Lv, Haixia Hu, Peiwen Ye</i>	
Coverage Probability Analysis of Three-Tier Heterogeneous Networks Based on Poisson Cluster Process.....	466
<i>Haixia Hu, Xiangdong Jia, Peiwen Ye, Yaping Lv, Yi Lu</i>	
LSTM-Based Frequency Hopping Sequence Prediction	472
<i>Gao Li, Jianliang Xu, Weiguo Shen, Wei Wang, Zitong Liu, Guoru Ding</i>	
Digital Channel Feature Map Assisted Airborne MIMO Communications.....	478
<i>Xiaochen Xia, Yurong Wang, Kui Xu, Wei Xie</i>	
On-Demand Coverage for Maritime Hybrid Satellite-UAV-Terrestrial Networks.....	483
<i>Yanmin Wang, Xinran Fang, Wei Feng, Yunfei Chen, Ning Ge, Zhou Lu</i>	
Source Detection of Sensor Array Based on Information Theory	489
<i>Deng Pan, Dazhuan Xu, Chao Hu</i>	
A Novel Channel Estimation Scheme for Frequency-Selective mmWave Massive MIMO Systems	494
<i>Zhigang Song, Jian Sun, Wensheng Zhang, Cheng-Xiang Wang, Minggao Zhang</i>	
A Novel Density-Based Performance Evaluation Index for Multipath Components Clustering.....	499
<i>Yuanyuan Qiao, Zhichao Yang, Tao Zhou, Shanshan Lin, Daohua Zhu</i>	
3D Stochastic Geometry Channel Model of Cell-Free Massive MIMO System	504
<i>Chengjian Liao, Kui Xu</i>	
Data-Driven Adaptive Control of Array Orientation in Massive MIMO Base Station	510
<i>Weiliang He, Cheng Zhang, Yongming Huang</i>	
Content-Aware Facial Image Compression with Deep Learning Method	516
<i>Shuzhan Hu, Yiping Duan, Xiaoming Tao, Yongjia Liu, Xuming Zhang, Jianhua Lu</i>	

A Meta-Learning-Based Approach for Hand Gesture Recognition Using FMCW Radar.....	522
<i>Zhongyu Fan, Haifeng Zheng, Xinxin Feng</i>	
Computation Offloading and Trajectory Design for UAV-assisted Mobile Computing Systems.....	528
<i>Chao Sun, Wei Ni, Xin Wang</i>	
A MAC Protocol Identification Approach Based on Convolutional Neural Network	534
<i>Xutong Zhang, Weiguo Shen, Jianliang Xu, Zitong Liu, Guoru Ding</i>	
Security Performance Analysis of Cell-Free Massive MIMO over Spatially Correlated Rayleigh Fading Channels with Active Spoofing Attack	540
<i>Xiaoyu Wang, Yuanyuan Gao, Guangna Zhang, Mingxi Guo</i>	
Clustered-Sparse Bayesian Learning for Channel Estimation in Underwater Acoustic OFDM Systems	546
<i>Shuaijun Wang, Deshi Li, Mingliu Liu, Wei Huang, Haole Chen, Yi Cen</i>	
Multi-intelligent Reflecting Surface-Aided Wireless Network with Achievable Rate Maximization	552
<i>Tao Zhou, Kui Xu</i>	
Adaptive SVM-Based Beam Allocation for MmWave Small Cell Networks	558
<i>Jiangpei Zhu, Dapeng Li, Haitao Zhao, Xiaoming Wang and Rui Jiang</i>	
Co-channel Modulation Recognition Based on Deep Learning	563
<i>Yuhong Xue, Zhutian Yang, Zhilu Wu, Siyang Zhou</i>	
CNN Based Wideband Spectrum Occupancy Status Identification for Cognitive Radios	569
<i>Yan Zhang, Bin Shen, Jiayuan Wang, Tingqiu Yan</i>	
Pilot Attack Identification and Elimination in Airborne Massive MIMO Systems by Exploiting the Sparse Structures of Channel.....	575
<i>Yurong Wang, Liang Wan, Kui Xu, Yuzhe Zhang, Yang Li, Zhiming Zhong, Gejingting Xu, Chengqian Ma</i>	
Multi-dimensional Data-Driven Mobile Edge Caching with Dynamic User Preference.....	580
<i>Mengge Liu, Dapeng Li, Haitao Zhao, Xiaoming Wang, Rui Jiang</i>	
Depthwise Separable Convolution Based Lightweight HSRRS Image Classification Method	586
<i>Wang Luoy, Tong Li, Weidong Yang, Tongwei Yu, Dingding Xi, Li Shen, Yuan Xia, Zhibin Yang, Huarong Xu</i>	
Sparse Reconstruction on Robust Dictionary for Accurate Salient Object Detection	591
<i>Wang, Yi Mao, Guodong Wu, Hongjun Wang, Hehao Niu, Lin Du</i>	
Network Coding-Based Relay Selection and Power Distribution for Underwater Cooperative Communication Networks	596
<i>Xuekun Chen, Hongjuan Yang, Qiming Wang, Bo Li</i>	
A Stochastic Coupling-Based Channel Impulse Response Matrix Model for Massive MIMO Channels.....	602
<i>Rong Dai, Yang Liu, Cheng-Xiang Wang, Yu Yu, Xin Guo</i>	
Secrecy Rate and Energy Harvesting Trade-off in Cognitive Wireless Energy Transfer Systems	608
<i>Ping Sun, Haibo Dai, Pei Li, Baoyun Wang</i>	

Spectrum Cartography Using the Variational Bayesian EM Algorithm	614
<i>Guoyong Zhang, Jun Wang, Xiaonan Chen, Li Li, Shaoqian Li</i>	

Arbitrary-Oriented Ship Detection Based on Feature Filter and KL Loss	620
<i>Chen Li, Lei Wang, Bin Kang, Mingkai Chen, Jingwu Cui, Baoyu Zheng</i>	

■ ■ Software Defined Wireless Communications-Architecture and Implementations Symposium

Joint Network Function Deployment and Route Selection for Energy Consumption Optimization in SDN.....	625
<i>Xizheng Yang, Rong Chai, Leilei Huang, Lei Zhang, Chengli Mei</i>	

An Optimization Toolchain Design of Deep Learning Deployment Based on Heterogeneous Computing Platform	631
<i>Jun Yin, Jun Han, Xiaodong Zhang</i>	

Heterogeneous Edge CNN Hardware Accelerator	636
<i>Mayan Moudgill, John Glossner, Wei Huang, Chaoyang Tian, Chunxia Xu, Nianliang Yang, Lei Wang, Tailin Liang, Shaobo Shi, Xiaodong Zhang, Daniel Iancu, Gary Nacer, Kerry Li</i>	

■ ■ Space Information Networks Symposium

Data Transmission Time Minimization for LEO Satellite-Terrestrial Integrated Networks	642
<i>Zhixiang Gao, Aijun Liu, Xiaohu Liang</i>	

Secrecy Performance Analysis of NOMA-Based Integrated Satellite-Terrestrial Relay Networks with Multiple Colluding Eavesdroppers.....	648
<i>Kefeng Guo, Xiaogang Tang, Daoxing Guo, Shibing Zhu, Kang An, Lunxin Zhong, Bangning Zhang</i>	

A Radio Environment Mapping Based Spectrum Awareness for Cognitive Space Information Network with GEO and LEO Coexistence	654
<i>Haitao Wang, Rongkai Ren, Dexin Qu, Gengxin Zhang</i>	

A Potential Game Approach to Multiple UAVs 3D Placement in IoT Communication Networks	660
<i>Binbin Wu, Bangning Zhang, Bing Zhao, Daoxing Guo, Xiaobo Ma, Guofeng Wei</i>	

Capacity-Oriented Satellite Constellation Design in Disaster Emergency Communication Network.....	666
<i>Cui-Qin Dai, Ting Yu, Qianbin Chen</i>	

UAV-Enabled Mobile Radiation Source Tracking with Deep Reinforcement Learning.....	672
<i>Jiangchun Gu, Haichao Wang, Guoru Ding, Yitao Xu, Yutao Jiao</i>	

Co-Frequency Interference Analysis between Large-Scale NGSO Constellations and GSO Systems.....	679
<i>Tianjia Wang, Wei Li, Yong Li</i>	

Satellite QoS Routing Algorithm Based on Energy Aware and Load Balancing	685
<i>Linchun Hao, Pinyi Ren, Qinghe Du</i>	

Compressive Sampling for Recognition of Frequency-Hopping Spread Spectrum Signals.....	691
<i>Hongbin Wang, Daoxing Guo, Bangning Zhang</i>	

Fast Beam Training for mmWave UAV Communications Using Machine Learning.....	697
<i>Yong Gu, Weizhi Zhong, Qiuming Zhu, Penghui Li, Xiaomin Chen</i>	
5G Integrated Satellite Communication Systems: Architectures, Air Interface, and Standardization.....	702
<i>Rui Ding, Tingting Chen, Liang Liu, Zhong Zheng, Yuanyuan Hao, Hanyu Zheng, Wenjin Wang, Li You</i>	
PAPR Analysis for Faster-Than-Nyquist Signaling in Satellite Communications.....	708
<i>Qiang Li, Yang Gao, Feng-Kui Gong, Wen-Yuan Zhao, Hai-Yang Ding, Yang Zhang</i>	
A Novel Spectrum Sharing Scheme for Cognitive Satellite Networks: A Game-Theoretic Approach	712
<i>Jili Wang, Daoxing Guo, Bangning Zhang</i>	
A Novel Satellite Network Traffic Prediction Method Based on GCN-GRU	718
<i>Li Yang, Xiangxiang Gu, Huaifeng Shi</i>	
Correlated Equilibrium Based Access Control for Integrated Satellite-Terrestrial Networks	724
<i>Zhuyun Chen, Daoxing Guo, Jie Zhang, Bing Zhao</i>	
Reliable Proactive Retransmission of Bundle Protocol for Deep-Space Communications in Presence of Link Disruption	730
<i>Ruhai Wang, Lei Yang, Yu Zhou, Kanglian Zhao</i>	
VCG Auction-Based Multi-Relay Selection in Hybrid Satellite-Terrestrial Overlay Networks	736
<i>Xiaokai Zhang, Bangning Zhang, Daoxing Guo, Yuewei Jia, Zhuyun Chen</i>	
■ Wireless Communications Symposium	
Robust Secure Beamforming in Cognitive MIMO Wiretap Channels with Bounded Channel Errors.....	742
<i>Jun Xiong, Xuanhan Zhou, Kuo Cao, Xiaoran Liu, Dongtang Ma</i>	
Research on Spectrum Map Dissemination for Data-Driven Cognitive Radio Networks	748
<i>Yue Zhang, Li Zhou, Xiang Tan, Qi Tang, Jibo Wei</i>	
Joint Mode Selection and Resource Allocation in D2D-Enabled Vehicular Network.....	755
<i>Liping Jiang, Xu Yang, Chaoqiong Fan, Bin Li, Chenglin Zhao</i>	
IRS-Assisted Crowd Spectrum Sensing in B5G Cellular IoT Networks	761
<i>Xiaohui Li, Qi Zhu, Ying Wang</i>	
A Joint Scheme for PAPR Reduction of OFDM Signals based on 3-D Constellation Rotation Encryption	766
<i>Xinjin Lu, Jing Lei, Wei Li, Yuxin Shi</i>	
On Contention-Based 2-Step Random Access Procedure.....	771
<i>Ziyang Li, Li Tian, Yachao Yin, Wei Cao</i>	
DGPA-ACB: Adaptive RAN Overload Avoidance Control for mMTC in 5G NR	777
<i>Yue Tu, Rongtao Xu</i>	
Physical Layer Security of NOMA with Decode-and-Forward Relaying in Underlay CR Network	783
<i>Mengyao Zhu, Zhen Yang, Youhong Feng</i>	

On the Exact and Asymptotic Analysis of Wireless Transmission over $\alpha - \mu$ /Inverse Gamma Composite Fading Channels	789
<i>Xiaoting Wang, Weijun Cheng, Xianmeng Xu</i>	
Device-to-Device Content Placement and Delivery Exploiting Joint Matching and Auction Theories	795
<i>Xiaojing Huang, Fengxia She, Kuan Wu, Ming Jiang</i>	
Energy Harvesting Jammer Enabled Secure Communication for Cooperative NOMA Systems	801
<i>Kunrui Cao, Buhong Wang, Haiyang Ding, Fengkui Gong, Hang Hu, Jiwei Tian, Tianhao Cheng</i>	
Noise-Aided Belief Propagation List Bit-Flip Decoder for Polar Codes	807
<i>Yuyu Yang, Chao Yin, Jan Qasim, Yaoyue Hu, Zhiwen Pan, Nan Liu, Xiaohu You</i>	
Deep Reinforcement Learning for Distributed Computation Offloading in Massive-User Mobile Edge Networks.....	811
<i>Bo Jiang, Kuikui Li, Bo Zhou, Meixia Tao, Zhiyong Chen</i>	
Channel Estimation Method Based on Transformer in High Dynamic Environment	817
<i>Zhuolin Chen, Fanglin Gu, Rui Jiang</i>	
Automatic Modulation Recognition Based on Multi-dimensional Feature Extraction	823
<i>Xiaodi Zhao, Xuanhan Zhou, Jun Xiong, Fang Li, Ling Wang</i>	
An Improved CQA Quantization Algorithm for Physical Layer Secret Key Extraction	829
<i>Lei Huang, Dengke Guo, Jun Xiong, Dongtang Ma</i>	
Symbiotic Communication: Concurrent Transmission for Multi-Users Based on Backscatter Communication	835
<i>Yanyan Liu, Pinyi Ren, Qinghe Du</i>	
Joint Time and Beam Domain Non-Orthogonal Multiple Access	840
<i>Jiajia Wu, Zhaoyang Zhang, Jue Wang</i>	
Covert Communications in D2D Underlying Cellular Networks with Multiple Wardens	847
<i>Jiawei Li, Meng Wang, Yida Wang, Xin Shi, Cheng Wan</i>	
3D Beamspace Index Modulation with Adaptive Activation	853
<i>Chu Zhou, Zhaoyang Zhang, Jue Wang, Xiaoxia Yu</i>	
Low-Rank Matrix Recovery for Topological Interference Management	860
<i>Xue Jiang, Baoyu Zheng, Lei Wang, Xiaoyun Hou</i>	
Spatial Multiplexing Modulation in Noncoherent MIMO-FCrSK System.....	865
<i>Guangpeng Zhou, Lin Zheng, Chao Yang</i>	
A Reliability-Based Adaptive IR-HARQ Scheme for Polar Coded Systems	871
<i>Rongchi Xu, Peiyao Chen, Min Zhu, Baoming Bai</i>	
A Robust Decentralized Multi-Sources Joint Power Spectra Separation and DOA Estimation Algorithm	877
<i>Li Li, Xiaonan Chen, Jun Wang, Wei Huang, Wei Li, Shaoqian Li</i>	
Multi-Antenna Covert Communication Achieved by Exploiting a Public Communication Link.....	883
<i>Lin Yuda, Jin Liang, Wang Hu, Xu Xiaoming</i>	

A Low-Complexity Residual Neural Network Based BP Decoder for Polar Codes.....	889
<i>Yuting Huang, Meixiang Zhang, Yin Dou</i>	
Maximum Ergodic Spectral Efficiency of Reconfigurable Intelligent Surface Assisted MIMO Systems under Correlated Channels.....	894
<i>Jinghe Wang, Hanqing Wang, Yu Han, Shi Jin, Xiao Li</i>	
Physical Layer Security in the Untrusted EH Relay Networks with the Cooperative Jammer.....	899
<i>Hui Shi, Guanjie Wang</i>	
Realization of Reconfigurable Intelligent Surface-Based Alamouti Space-Time Transmission	904
<i>Wankai Tang, Jun Yan Dai, Ming Zheng Chen, Yu Han, Xiao Li, Chao-Kai Wen, Shi Jin, Qiang Cheng, Tie Jun Cui</i>	
Joint Beamforming and Artificial Noise Design in Intelligent Reflecting Surface Aided Secure Wireless Communications	910
<i>Pei Liu, Kai Zhang, Changchuan Yin</i>	
Collaborative Online Caching with Freshness in the Internet of Things.....	916
<i>Xu Zhao, Qi Zhu</i>	
Training Efficiency of Federated Learning: A Wireless Communication Perspective.....	922
<i>Shunan Yang, Yuan Liu</i>	
Reinforcement Learning Based Energy Efficient Underwater Localization.....	927
<i>Xudong You, Zefang Lv, Yuzhen Ding, Wei Su, Liang Xiao</i>	
Detection Schemes of Illegal Spectrum Access Behaviors in Multiple Authorized Users Scenario	933
<i>Hao Fang, Tao Zhang, Yueming Cai, Linyuan Zhang, Hao Wu</i>	
LoRa Network Planning Based on Improved ISODATA Algorithm.....	939
<i>Yiqing Jin, Lianghui Ding, Feng Yang, Liang Qian, Cheng Zhi</i>	
DOA Clustering-Based Channel Estimation for Mitigating Pilot Contamination in Massive MIMO System.....	945
<i>Jiashu Lin, Daofeng Li, Sihai Zhang, Jinkang Zhu</i>	
A Novel Non-Stationary Cylinder Model for Massive MIMO Air-To-Ground (A2G) Channels	951
<i>Shihao Chen, Nan Ma, Jianqiao Chen, Xiaoli Yang, Baoling Liu</i>	
Iterative Soft Decoding of Reed-Solomon Tail-Biting Convolutional Concatenated Codes	957
<i>Jianchao Ye, Ting-Yi Wu, Jiongyue Xing, Li Chen</i>	
Robust Trajectory and Scheduling Design for Turning Angle-Constrained UAV Communications	962
<i>Yufang Gao, Wendong Yang, Yang Wu, Zhichao Cui, Yu Yu</i>	
A Data Protection-Oriented Design Procedure for a Federated Learning Framework	968
<i>Yu Yue, Zeng Ming, Qiu Zhijie, Luo Lei, Chen Hong</i>	
Deep Learning-Based Joint Activity Detection and Channel Estimation for Massive Access: When More Antennas Meet Fewer Pilots	975
<i>Xiaodan Shao, Xiaoming Chen, Derrick Wing Kwan Ng, Caijun Zhong, Zhaoyang Zhang</i>	

Joint Blocklength and Power Optimization for Half Duplex Unmanned Aerial Vehicle Relay System with Short Packet Communications	981
<i>Baoquan Yu, Xinrong Guan, Yueming Cai</i>	
An Improved Multiple Bit-Flipping Successive Cancellation Decoding Algorithm for Polar Codes.....	987
<i>Sha Sha, Li Zhang, Yejun He</i>	
Switching Time Optimization for Time-Division Multiplexing-Based Wide-Band Channel Sounding	992
<i>Jiayi Hu, Xuefeng Yin, Linjian Zhang</i>	
Deep-Learning-Based Bouncing-Order Prediction for Propagation Channel Characterization Using Graph Modeling	998
<i>Lin Yang, Xuefeng Yin, José Rodríguez-Piñero</i>	
Lightweight Security Mechanism Based on Heterogeneous Construction for Virtualized Edge System: A Markov Decision Process Approach.....	1003
<i>Qimei Cui, Changzheng Huang, Zengbao Zhu, Xueqing Huang, Na Li, Xiaofeng Tao, Ping Zhang</i>	
Worst Case Latency Optimization-Based Joint Computation Offloading and Scheduling for Interdependent Subtasks	1010
<i>Tiantian Yang, Rong Chai, Liping Zhang, Qianbin Chen</i>	
A Novel 3D Non-Stationary Multi-Frequency Multi-Link Wideband MIMO WLAN Channel Model	1016
<i>Li Zhang, Zihao Zhou, Xinyue Chen, Cheng-Xiang Wang</i>	
Low Complexity ICI Mitigation in OFDM Based RadCom Systems	1022
<i>Qing Zhou, Xuanxuan Tian, Tingting Zhang</i>	
Robust Secure UAV-Enabled Multiple User Communication with Fairness Consideration	1028
<i>Wenlu Fan, Yang Wu, Xiaoli Sun, Weiwei Yang</i>	
A Fairness-Oriented Carrier Selection Algorithm for LTE-U and WiFi Coexistence Networks.....	1034
<i>Jiixin Tang, Jun Zheng</i>	
A Smart Content Caching and Replacement Scheme for UAV-Assisted Fog Computing Network.....	1040
<i>Xujie Li, Jichang Shen, Ying Sun, Ziya Wang, Xuedong Zheng</i>	
■ Wireless Networks and Unmanned Systems Symposium	
Real-Time Successful Broadcasting Ratio and Distance Based Broadcast for Vehicular Ad Hoc Networks.....	1046
<i>Yinan Luo, Xue Su, Yanping Yu, Qichao Cao, Zhengwei Ni</i>	
Research on Dynamic Probability Mechanism of Rebroadcasting for UAV Swarm.....	1052
<i>Zhen Qin, Tingjun Du, Fei Xiong, Hai Wang, Aijing Li, Yajie Chen</i>	
Min-Max Path Planning of Multiple UAVs for Autonomous Inspection	1058
<i>Jiayue Liu, Yan Zhang, Xijun Wang, Chao Xu, Xiao Ma</i>	
Dynamic Coordination in UAV Swarm Assisted MEC via Decentralized Deep Reinforcement Learning.....	1064
<i>Yuting Ye, Wenshu Wei, Dongqing Geng, Xiaofan He</i>	

State Estimation and Control for Micro Aerial Vehicles in GPS-denied Environments	1070
<i>Hongming Shen, Xuwei Zhang, Hanchen Lu, Bailing Tian, Qun Zong</i>	
A Cournot Game Approach in the Duty Cycle in CSAT Algorithm for WiFi/LTE-U Coexistence	1076
<i>Zichao Qin, Aijing Li, Hai Wang</i>	
The Implementation of Asynchronous Advantage Actor-Critic with Stigmergy in Network-Assisted Multi-agent System	1082
<i>Kun Chen, Rongpeng Li, Zhifeng Zhao, Honggang Zhang</i>	
A TDMA-Based MAC Protocol with Auxiliary Reservation on a Service Channel for VANETs	1088
<i>Lei Huang, Lianghai Ding, Liang Qian, Feng Yang, Cheng Zhi</i>	
Stochastic Geometry Analysis of Three-Dimensional Aerial Ad Hoc Network with Directional Antennas	1094
<i>Lin Ge, Renhui Xu, Laixian Peng, Yaoqi Yang</i>	
Delay and Transmission Rate Analysis of Buffer-Aided UAV Networks for Emergency Communications.....	1100
<i>Yu Zhang, Guangping Lu, Jing Zhang</i>	
Graph Convolutional Multi-Agent Reinforcement Learning for UAV Coverage Control	1106
<i>Anna Dai, Rongpeng Li, Zhifeng Zhao, Honggang Zhang</i>	
Learning-Based Safety-Stability-Driven Control for Safety-Critical Systems under Model Uncertainties	1112
<i>Lei Zheng, Rui Yang, Jiesan Pan, Hui Cheng, Haifeng Hu</i>	
MSE Minimized Scheduling for Multiple-Source Remote Estimation with AoI Constraints in IWSN.....	1119
<i>Kehong Chen, Lianghai Ding, Feng Yang, Liang Qian</i>	
A Minimum-Latency All-to-All Broadcast Algorithm in Aerial Ad Hoc Network with Directional Antennas	1125
<i>Lin Ge, Renhui Xu, Laixian Peng, Yaoqi Yang</i>	
Mobility-Aware Trajectory Design for Aerial Base Station Using Deep Reinforcement Learning	1131
<i>Guoliang Hao, Wanli Ni, Hui Tian, Leilei Cao</i>	
Neighbor Discovery Algorithm in Wireless Ad Hoc Networks Based on Successive Interference Cancellation Technology	1137
<i>Yueyue Liang, Zhiqing Wei, Qian Chen, Huici Wu</i>	
Spatial-Temporal Gaussian Visit Model for Mobile Crowd Sensing	1142
<i>Jixuan Zhou, Mingliu Liu, Deshi Li</i>	
Energy-Efficient UAV Deployment and Task Scheduling in Multi-UAV Edge Computing	1147
<i>Yangang Wang, Hai Wang, Xianglin Wei</i>	
Change the Pattern: Exploring Sensing-Communication in Wireless Networks	1153
<i>Siyang Liu, Tingting Yang, Xiaoying Gan, Minghua Xia</i>	
5G Multi-Service Scenarios-Oriented Resource Allocation and NOMA Pairing Scheme for Energy Efficiency Maximization	1159
<i>Rong Chai, Pengfei Ma, Fei Zou</i>	

UAV-Based Estimation of Direction of Arrival: An Approach Based on Image Processing.....	1165
<i>Lingyu Wang, Yang Huang</i>	
Uncertain Preference Matching-Based Relay Selection and Position Adjustment in Dynamic UAV Systems	1170
<i>Dianxiong Liu, Yang Yang, Yuhua Xu, Ximing Wang, Yifan Xu</i>	
Distributed Resource Allocation Algorithm in Fog Networks with Energy Cooperation	1176
<i>Yunjun Zheng, Weiwei Xia, Long Jiang, Feng Yan, Lianfeng Shen, Yinong Zhang, Yingbin Gao</i>	
Safeguarding Multi-UAVs Relaying Communications via Joint Trajectory Design and Power Control	1182
<i>Song Gao, Yong Ma, Bin Duo</i>	
QoS Sensitive Routing Algorithm with Link Quality Prediction in SDN-Based Ad Hoc Networks	1188
<i>Long Jiang, Weiwei Xia, Yunjun Zheng, Feng Yan, Lianfeng Shen, Yinong Zhang, Xiaodong Yang</i>	
Networked Robotic System Simulation Platform: Hardware-in-the-Loop Architecture, Enabling Technologies and Implementations	1194
<i>Han Han, Wei Gao, Honglei Yan, Jiajun Bai, Jun Cai, Xiaolei Wang, Bo Zhang, Jinlin Peng, Xiaodong Yi, Yuhua Tang</i>	
Optimal Power Allocation of Cooperative NOMA with Finite Blocklength Codes	1200
<i>Siling Liu, Zhengchuan Chen, Jinfeng Xie, Liang Liang, Min Wang, Yunjian Jia</i>	
Uplink Performance Analysis of Cellular-Based Energy Harvesting IoT Networks	1206
<i>Yuhang Nan, Hongguang Sun, Huanhuan Shen, Shuqin Li, Hongming Zhang, Chao Xu</i>	
Relay Selection Based on Trajectory Prediction for UAV Networks.....	1212
<i>Yajie Chen, Hai Wang, Fei Xiong, Aijing Li, Zhen Qin, Jin Yuan</i>	