

# Listings 2022 of *China Communications*

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Looking back on the past months, *China Communications* launched special issues or columns on hot issues such as 6G, artificial intelligence, network security, etc. While expanding the source of high-quality manuscripts and shortening the publication cycle, the journal witnessed an increase of the SCI impact factor to 3.170, entering the Q2 sector of the telecom category.

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Listed are the information of Feature Topics and papers published in 2022

[Feature Topic: Space-Air-Ground Integrated Network with Native Intelligence \(NI-SAGIN\): Concept, Architecture, Access and Networking](#)

Guest Editors: Zhenyu Xiao, Qihui Wu, Jiajia Liu, Ning Zhang, Tao Sun

2022, Vol.19, No. 1

[Feature Topic: Brain-Computer-Interface Inspired Communications](#)

Guest Editors: Honglin Hu, Xianfu Chen, Tao Jiang

2022, Vol.19, No. 2

[Feature Topic: 6G Towards 2030: from Key Technology to Network Architecture](#)

Guest Editor: Guangyi Liu, Jinkang Zhu, Yongming Huang, Jianhua Zhang, Xiaoming Tao

2022, Vol.19, No. 3

### [Feature Topic: Ai-Empowered Future Communication Networks](#)

Guest Editor: Depeng Jin, Xiaoming Tao, Xiaofeng Zhong, Jintao Wang

2022, Vol.19, No. 3

### [Feature Topic: Recent Advances in Mobile Communication Network Security](#)

Guest Editor: Kaiping Xue, Jianqing Liu, Liehuang Zhu, David S.L.Wei, Rongxing Lu

2022, Vol.19, No. 6

### [Feature Topic: Intelligent Interference Management and Secure Communications for Satellite-Terrestrial Integrated Systems](#)

Guest Editor: Lidong Zhu, Michele Luglio, Gengxin Zhang, Mingchuan Yang

2022, Vol.19, No. 7

## Papers in 2022

### January

Click to read : [China Communications Vol.19 No.1 2022](#)

#### Service Customized Space-Air-Ground Integrated Network for Immersive Media: Architecture, Key Technologies, and Prospects

Keywords: space-air-ground integrated network; architecture; immersive media; service customized network; intelligent

Cite as: Linhui Wei, Jiacheng Shuai, Yu Liu, Yumei Wang, Lin Zhang"Service Customized Space-Air-Ground Integrated Network for Immersive Media: Architecture, Key Technologies, and Prospects"[J]China Communications,vol.19,no.1,pp.1-13,2022

#### Holistic Service-Based Architecture for Space-Air-Ground Integrated Network for 5G-Advanced and Beyond

Keywords: holistic service-based architecture; SBA; 5G-advanced evolution; space-air-ground integrated architecture; 6G architecture

Cite as: Xiaoyun Wang, Tao Sun, Xiaodong Duan, Dan Wang, Yongjing Li, Ming Zhao, Zhigang Tian"Holistic Service-Based Architecture for Space-Air-Ground Integrated Network for 5G-Advanced and Beyond"[J]China Communications,vol.19,no.1,pp.14-28,2022

#### Civil Aircraft Assisted Space-Air-Ground Integrated Networks: Architecture Design and Coverage Analysis

Keywords: AI-enabled space-air-ground integrated networks; civil aircraft assisted networks; satellite constellation design; joint coverage analysis

Cite as: Shuxun Li, Qian Chen, Zhe Li, Weixiao Meng, Cheng Li "Civil Aircraft Assisted Space-Air-Ground Integrated Networks: Architecture Design and Coverage Analysis" [J] China Communications, vol. 19, no. 1, pp. 29-39, 2022

### ESMD-Flow: An Intelligent Flow Forwarding Scheme with Endogenous Security Based on Mimic Defense in Space-Air-Ground Integrated Network

Keywords: space-air-ground integrated network (SAGIN); endogenous security; multipath routing; multi-protocol forwarding

Cite as: Ziyong Li, Yuxiang Hu, Di Zhu, Jiangxing Wu, Yunjie Gu "ESMD-Flow: An Intelligent Flow Forwarding Scheme with Endogenous Security Based on Mimic Defense in Space-Air-Ground Integrated Network" [J] China Communications, vol. 19, no. 1, pp. 40-51, 2022

### Intelligent Passive Detection of Aerial Target in Space-Air-Ground Integrated Networks

Keywords: aerial target detection; decoupling echo state networks; delayed feedback networks; multilayer perceptron; satellite illuminator; space-air-ground integrated networks

Cite as: Mingqian Liu, Chunheng Liu, Ming Li, Yunfei Chen, Shifei Zheng, Nan Zhao "Intelligent Passive Detection of Aerial Target in Space-Air-Ground Integrated Networks" [J] China Communications, vol. 19, no. 1, pp. 52-63, 2022

### 6G Service Coverage with Mega Satellite Constellations

Keywords: 6G; mega satellite constellations; on-demand service coverage; un-uniform traffic demands; resource management

Cite as: Min Sheng, Di Zhou, Weigang Bai, Junyu Liu, Jiandong Li "6G Service Coverage with Mega Satellite Constellations" [J] China Communications, vol. 19, no. 1, pp. 64-76, 2022

### Multi-Objective Deep Reinforcement Learning Based Time-Frequency Resource Allocation for Multi-Beam Satellite Communications

Keywords: multi-beam satellite communications; time-frequency resource allocation; multi-objective optimization; deep reinforcement learning

Cite as: Yuanzhi He, Biao Sheng, Hao Yin, Di Yan, Yingchao Zhang "Multi-Objective Deep Reinforcement Learning Based Time-Frequency Resource Allocation for Multi-Beam Satellite Communications" [J] China Communications, vol. 19, no. 1, pp. 77-91, 2022

### A Fast and Accurate LEO Satellite-Based Direct Position Determination Assisted by TDOA Measurements

Keywords: direct position determination; LEO satellite constellation; passive localization; TDOA

Cite as: Shijie Li, Qianyun Zhang, Boyu Deng, Biyi Wu, Yue Gao "A Fast and Accurate LEO Satellite-Based Direct Position Determination Assisted by TDOA Measurements"[J]China Communications,vol.19,no.1,pp.92-103,2022

### Joint Task Scheduling, Resource Allocation, and UAV Trajectory under Clustering for FANETs

Keywords: flying ad hoc networks (FANETs); successive convex approximation; clustering; mobile edge computing (MEC)

Cite as: Wenjing You, Chao Dong, Qihui Wu, Yuben Qu, Yulei Wu, Rong He "Joint Task Scheduling, Resource Allocation, and UAV Trajectory under Clustering for FANETs"[J]China Communications,vol.19,no.1,pp.104-118,2022

### Joint Scheduling and Resource Allocation for Federated Learning in SWIPT-Enabled Micro UAV Swarm Networks

Keywords: micro unmanned aerial vehicle; federated learning; simultaneous wireless information and power transfer; scheduling; resource allocation

Cite as: Wanli Wen, Yunjian Jia, Wenchao Xia "Joint Scheduling and Resource Allocation for Federated Learning in SWIPT-Enabled Micro UAV Swarm Networks"[J]China Communications,vol.19,no.1,pp.119-135,2022

### Joint Power-Trajectory-Scheduling Optimization in A Mobile UAV-Enabled Network via Alternating Iteration

Keywords: UAV MEC network; D2D; joint optimization; energy efficiency

Cite as: Xiaohan Qi; Minxin Yuan; Qinyu Zhang; Zhihua Yang "Joint Power-Trajectory-Scheduling Optimization in A Mobile UAV-Enabled Network via Alternating Iteration"[J]China Communications,vol.19,no.1,pp.136-152,2022

### UAV-Assisted Data Offloading for Smart Container in Offshore Maritime Communications

Keywords: data offloading; smart container; unmanned aerial vehicle; maritime Internet of Things

Cite as: Yanpeng Dai, Bin Lin, Yudi Che, Ling Lyu "UAV-Assisted Data Offloading for Smart Container in Offshore Maritime Communications"[J]China Communications,vol.19,no.1,pp.153-165,2022

### Predictive Decision and Reliable Accessing for UAV Communication in Space-Air-Ground Integrated Networks

Keywords: space-air-ground integrated networks; UAV communication; air communication controlling; predictive decision; reliable accessing

Cite as: Bowen Zeng, Zhongshan Zhang, Xuhui Ding, Xiangyuan Bu, Jianping An "Predictive Decision and Reliable Accessing for UAV Communication in Space-Air-Ground Integrated Networks"[J]China Communications,vol.19,no.1,pp.166-185,2022

### Routing Protocol for Heterogeneous FANETs with Mobility Prediction

Keywords: routing; unmanned aerial vehicles (UAVs); flying ad hoc networks (FANETs); mobility prediction; particle swarming optimization (PSO)

Cite as: Qihui Wu, Min Zhang, Chao Dong, Yong Feng, Yanli Yuan, Simeng Feng, Tony Q. S. Quek "Routing Protocol for Heterogeneous FANETs with Mobility Prediction"[J]China Communications,vol.19,no.1,pp.186-201,2022

### Safe Navigation for UAV-Enabled Data Dissemination by Deep Reinforcement Learning in Unknown Environments

Keywords: Unmanned aerial vehicles (UAVs); safe autonomous navigation; unknown environments; data dissemination; dueling double deep Q network (dueling DDQN)

Cite as: Fei Huang, Guangxia Li, Shiwei Tian, Jin Chen, Guangteng Fan, Jinghui Chang "Safe Navigation for UAV-Enabled Data Dissemination by Deep Reinforcement Learning in Unknown Environments"[J]China Communications,vol.19,no.1,pp.202-217,2022

### Recent Advances in Data-Driven Wireless Communication Using Gaussian Processes: A Comprehensive Survey

Keywords: wireless communication; Gaussian process; machine learning; kernel; interpretability; uncertainty

Cite as: Kai Chen, Qinglei Kong, Yijue Dai, Yue Xu, Feng Yin, Lexi Xu, Shuguang Cui "Recent Advances in Data-Driven Wireless Communication Using Gaussian Processes: A Comprehensive Survey"[J]China Communications,vol.19,no.1,pp.218-237,2022

### Hybrid Image Compression-Encryption Scheme Based on Multilayer Stacked Autoencoder and Logistic Map

Keywords: compression-encryption; stacked autoencoder; chaotic system; back propagation algorithm; logistic map

Cite as: Neetu Gupta, Ritu Vijay "Hybrid Image Compression-Encryption Scheme Based on Multilayer Stacked Autoencoder and Logistic Map"[J]China Communications,vol.19,no.1,pp.238-252,2022

### Three-Dimensional Cooperative Localization via Space-Air-Ground Integrated Networks

Keywords: space-air-ground integrated network (SAGIN); three-dimensional (3D) localization; clock noise; multi-source information

Cite as: Wenxuan Li, Yuanpeng Liu, Xiaoxiang Li, Yuan Shen"Three-Dimensional Cooperative Localization via Space-Air-Ground Integrated Networks"[J]China Communications,vol.19,no.1,pp.253-263,2022

### Separate Least Mean Square Based Equalizer with Joint Optimization for Multi-CAP Visible Light Communication

Keywords: visible light communication; Internet of Things; equalization; least mean square

Cite as: Jianli Jin, Jianping Wang, Huimin Lu, Danyang Chen"Separate Least Mean Square Based Equalizer with Joint Optimization for Multi-CAP Visible Light Communication"[J]China Communications,vol.19,no.1,pp.264-273,2022

### Blockchain Technology Empowers Telecom Network Operation

Keywords: blockchain; 5G; IoT; smart contracts; BSN

Cite as: Huidi Li, Peng Gao, Yi Zhan, Min Tan"Blockchain Technology Empowers Telecom Network Operation"[J]China Communications,vol.19,no.1,pp.274-283,2022

### Symbol Detection Based on Temporal Convolutional Network in Optical Communications

Keywords: deep learning; optical communicaitons; quadrature amplitude modulation; symbol detection

Cite as: Yingzhe Luo, Jianhao Hu "Symbol Detection Based on Temporal Convolutional Network in Optical Communications"[J]China Communications,vol.19,no.1,pp.284-292,2022

## February

Click to read : [China Communications Vol.19, No.2 2022](#)

### A User-Friendly SSVEP-Based BCI Using Imperceptible Phase-Coded Flickers at 60Hz

Keywords: brain-computer interface; electroencephalogram; steady-state visual evoked potentials; imperceptible flickers; phase coding; task related component analysis

Cite as: Lu Jiang, Weihua Pei, Yijun Wang"A User-Friendly SSVEP-Based BCI Using Imperceptible Phase-Coded Flickers at 60Hz"[J]China Communications,vol.19,no.2,pp.1-14,2022

### Steady-State Visual Evoked Potential (SSVEP) in a New Paradigm Containing Dynamic Fixation Points

Keywords: SSVEP; spatial-coding; dual-stimulation; correlation coefficient ratio

Cite as: Yuang Li, Yong Ge, Xuefei Zhong, Xiong Zhang"Steady-State Visual Evoked Potential (SSVEP) in a New Paradigm Containing Dynamic Fixation Points"[J]China Communications,vol.19,no.2,pp.15-30,2022

### Toward a Neurophysiological Measure of Image Quality Perception Based on Algebraic Topology Analysis

Keywords: image quality assessment; electroencephalogram; algebraic topology analysis; Euler characteristic

Cite as: Chang Liu, Xiaoyu Ma, Yijie Zhou, Jiaojiao Wang, Dingguo Yu"Toward a Neurophysiological Measure of Image Quality Perception Based on Algebraic Topology Analysis"[J]China Communications,vol.19,no.2,pp.31-38,2022

### Transfer Learning Algorithm Design for Feature Transfer Problem in Motor Imagery Brain-computer Interface

Keywords: brain-computer interface; motor imagery; feature transfer; transfer learning; domain adaptation

Cite as: Yu Zhang, Huaqing Li, Heng Dong, Zheng Dai, Xing Chen, Zhuoming Li"Transfer Learning Algorithm Design for Feature Transfer Problem in Motor Imagery Brain-computer Interface"[J]China Communications,vol.19,no.2,pp.39-46,2022

### Removal of Ocular Artifacts from Electroencephalo-Graph by Improving Variational Mode Decomposition

Keywords: ocular artifact; variational mode decomposition; squirrel search algorithm; global guidance ability; opposition-based learning

Cite as: Miao Shi, Chao Wang, Wei Zhao, Xinshi Zhang, Ye Ye, Nenggang Xie"Removal of Ocular Artifacts from Electroencephalo-Graph by Improving Variational Mode Decomposition"[J]China Communications,vol.19,no.2,pp.47-61,2022

### BCI+VR Rehabilitation Design of Closed-Loop Motor Imagery Based on the Degree of Drug Addiction

Keywords: drug addiction degree; brain-computer interface, motor imagery; virtual reality; drug addiction rehabilitation

Cite as: Xuelin Gu, Banghua Yang, Shouwei Gao, Honghao Gao, Linfeng Yan, Ding Xu, Wen Wang"BCI+VR Rehabilitation Design of Closed-Loop Motor Imagery Based on the Degree of Drug Addiction"[J]China Communications,vol.19,no.2,pp.62-72,2022

### E3GCAPS: Efficient EEG-Based Multi-Capsule Framework with Dynamic Attention for Cross-Subject Cognitive State Detection

Keywords: electroencephalography (EEG); capsule network; cognitive state detection; cross-subject

Cite as: Yue Zhao, Guojun Dai, Xin Fang, Zhengxuan Wu, Nianzhang Xia, Yanping Jin, Hong Zeng"E3GCAPS: Efficient EEG-Based Multi-Capsule Framework with Dynamic Attention for Cross-Subject Cognitive State Detection"[J]China Communications,vol.19,no.2,pp.73-89,2022

### Space-Air-Ground Integrated Network (SAGIN) for 6G: Requirements, Architecture and Challenges

Keywords: 6G; AI; DT; SAGIN; NTN; Network architecture.

Cite as: Huanxi Cui, Jun Zhang, Yuhui Geng, Zhenyu Xiao,Tao Sun, Ning Zhang, Jiajia Liu, Qihui Wu , Xianbin Cao "Space-Air-Ground Integrated Network (SAGIN) for 6G: Requirements, Architecture and Challenges"[J]China Communications,vol.19,no.2,pp.90-108,2022

### Sensitivity and Distance Based Performance Analysis for Batteryless Tags with Transmit Beamforming and Ambient Backscattering

Keywords: ambient backscatter; battery-free tag; Internet of Things (IoT); outage probability; performance analysis; sensitivity; transmission distance

Cite as: Minzheng Jia, Chaochao Yao, Wei Liu, Ruyi Ye, Tutun Juhana, Bo Ai"Sensitivity and Distance Based Performance Analysis for Batteryless Tags with Transmit Beamforming and Ambient Backscattering"[J]China Communications,vol.19,no.2,pp.109-117,2022

### Successive Interference Cancellation and Alignment in $K$ -User MIMO Interference Channels with Partial Unidirectional Strong Interference

Keywords: interference alignment; successive interference cancellation; interference management; ultra dense networks

Cite as: Long Suo, Hongyan Li, Shun Zhang, Jiandong Li "Successive Interference Cancellation and Alignment in  $K$ -User MIMO Interference Channels with Partial Unidirectional Strong Interference"[J]China Communications,vol.19,no.2,pp.118-130,2022

### Robust Trajectory and Communication Design for Angle-Constrained Multi-UAV Communications in the Presence of Jammers

Keywords: anti-jamming; angle constraints; robust design; multi-UAV communications; 3D trajectory optimization

Cite as: Yufang Gao, Yang Wu, Zhichao Cui, Wendong Yang, Guojie Hu, Shiming Xu"Robust Trajectory and Communication Design for Angle-Constrained Multi-UAV Communications in the Presence of Jammers"[J]China Communications,vol.19,no.2,pp.131-147,2022

### Design of a Microwave Filter Based on a Novel Negative Coupling Structure with Conical Through-Hole

Keywords: ceramic waveguide filter; negative coupling structure; out-of-band suppression characteristics; cross-coupling slot

Cite as: Shunliang Meng, Fei Liang, Wenzhong Lu, Zihang Lin, Yuhao Yin, Rong Zhang"Design of a Microwave Filter Based on a Novel Negative Coupling Structure with Conical Through-Hole"[J]China Communications,vol.19,no.2,pp.148-157,2022

### A Security Enhancement Model Based on Switching Edge Strategy in Interdependent Heterogeneous Cyber-Physical Systems

Keywords: security enhancement; switching edge strategy; interdependent systems; cyber-physical systems

Cite as: Dandan Zhao, Can Liu, Guangquan Xu, Zhiguo Ding, Hao Peng, Juan Yu, Jianmin Han"A Security Enhancement Model Based on Switching Edge Strategy in Interdependent Heterogeneous Cyber-Physical Systems"[J]China Communications,vol.19,no.2,pp.158-173,2022

### Cryptomining Malware Detection Based on Edge Computing-Oriented Multi-Modal Features Deep Learning

Keywords: cryptomining malware; multi-modal; ensemble learning; deep learning; edge computing

Cite as: Wenjuan Lian, Guoqing Nie, Yanyan Kang, Bin Jia, Yang Zhang"Cryptomining Malware Detection Based on Edge Computing-Oriented Multi-Modal Features Deep Learning"[J]China Communications,vol.19,no.2,pp.174-185,2022

### Secure Transmissions in Wireless Multiuser Networks Using Message Correlation

Keywords: physical-layer security; multiuser networks; user selection; message correlation; NOMA

Cite as: Hongliang He, Libo Wang"Secure Transmissions in Wireless Multiuser Networks Using Message Correlation"[J]China Communications,vol.19,no.2,pp.186-200,2022

### Outsourced Privacy-Preserving Anomaly Detection in Time Series of Multi-Party

Keywords: anomaly detection; interval hash table; privacy-preserving; multiple participants

Cite as: Chunkai Zhang, Wei Zuo, Peng Yang, Ye Li, Xuan Wang"Outsourced Privacy-Preserving Anomaly Detection in Time Series of Multi-Party"[J]China Communications,vol.19,no.2,pp.201-213,2022

### Deep Learning-Based Prediction of Traffic Accidents Risk for Internet of Vehicles

Keywords: road safety, risk prediction, Internet of Vehicles

Cite as: Haitao Zhao, Xiaoqing Li, Huiling Cheng, Jun Zhang, Qin Wang, Hongbo Zhu"Deep Learning-Based Prediction of Traffic Accidents Risk for Internet of Vehicles"[J]China Communications,vol.19,no.2,pp.214-224,2022

### A Multi-Agent Based Model for User Interest Mining on Sina Weibo

Keywords: multi-agent system; user interest mining; adaptive model; Sina Weibo; online social network

Cite as: Meijia Wang, Qingshan Li"A Multi-Agent Based Model for User Interest Mining on Sina Weibo"[J]China Communications,vol.19,no.2,pp.225-234,2022

### Reliability Evaluation of All-User Terminals in LEO Satellite Communication Network Based on Modular Reduction

Keywords: reliability evaluation; LEO satellite communication network; modular approach; full probability formula; all-user terminals

Cite as: Yangyang Du, Sifeng Liu, Zhigeng Fang, Su Gao"Reliability Evaluation of All-User Terminals in LEO Satellite Communication Network Based on Modular Reduction"[J]China Communications,vol.19,no.2,pp.235-246,2022

### Load Balancing Routing Algorithm Based on Extended Link States in LEO Constellation Network

Keywords: LEO satellite; routing algorithm; congestion avoidance; load balancing

Cite as: Chaoying Dong, Xin Xu, Aijun Liu, Xiaohu Liang"Load Balancing Routing Algorithm Based on Extended Link States in LEO Constellation Network"[J]China Communications,vol.19,no.2,pp.247-260,2022

## **March**

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### **Micro-Service-Based Radio Access Network**

Keywords: 6G; micro-service; SBA-RAN

Cite as: Na Li, Guangyi Liu, Huimin Zhang, Quan Zhao, Yun Zhao, Zhou Tong, Yingying Wang, Junshuai Sun"Micro-Service-Based Radio Access Network"[J]China Communications,vol.19,no.3,pp.1-15,2022

### **Intelligent Decision Making Framework for 6G Network**

Keywords: 6G wireless communication network; reinforcement learning; cognition intelligence

Cite as: Zheng Hu, Ping Zhang, Chunhong Zhang, Benhui Zhuang, Jianhua Zhang, Shangjing Lin, Tao Sun"Intelligent Decision Making Framework for 6G Network"[J]China Communications,vol.19,no.3,pp.16-35,2022

### **Cloud-Assisted Distributed Edge Brains for Multi-Cell Joint Beamforming Optimization for 6G**

Keywords: artificial intelligence; collaborative cloud edge; centralized cloud brain; decentralized edge brain; 6G mobile communication

Cite as: Juan Deng, Kaicong Tian, Qingbi Zheng, Jieli Bai, Kuo Cui, Yitong Liu, Guangyi Liu"Cloud-Assisted Distributed Edge Brains for Multi-Cell Joint Beamforming Optimization for 6G"[J]China Communications,vol.19,no.3,pp.36-49,2022

### **Green Concerns in Federated Learning over 6G**

Keywords: 6G; native AI; federated learning; radio access network; green communications

Cite as: Borui Zhao, Qimei Cui, Shengyuan Liang, Jinli Zhai, Yanzhao Hou, Xueqing Huang, Miao Pan, Xiaofeng Tao"Green Concerns in Federated Learning over 6G"[J]China Communications,vol.19,no.3,pp.50-69,2022

### **Unourced Multiple Access for 6G Massive Machine Type Communications**

Keywords: unourced multiple access; machine type communications; 6G; massive random access; uncoordinated

Cite as: Yuanjie Li, Jincheng Dai, Zhongwei Si, Kai Niu, Chao Dong, Jiaru Lin, Sen Wang, Yifei Yuan"Unsources Multiple Access for 6G Massive Machine Type Communications"[J]China Communications,vol.19,no.3,pp.70-87,2022

### Performance Analysis of Sparse Array based Massive MIMO via Joint Convex Optimization

Keywords: B5G; 6G; sparse array; joint convex optimization; massive MIMO; system-level simulation

Cite as: Mengting Lou, Jing Jin, Hanning Wang, Dan Wu, Liang Xia, Qixing Wang, Yifei Yuan, Jiangzhou Wang"Performance Analysis of Sparse Array based Massive MIMO via Joint Convex Optimization"[J]China Communications,vol.19,no.3,pp.88-100,2022

### Joint Source-Channel Coding for 6G Communications

Keywords: 6G; joint source and channel coding; double LDPC codes; double polar codes

Cite as: Yanfei Dong, Jincheng Dai, Kai Niu, Sen Wang, Yifei Yuan"Joint Source-Channel Coding for 6G Communications"[J]China Communications,vol.19,no.3,pp.101-115,2022

### Transmit Diversity Scheme Design for Rectangular Pulse Shaping Based OTFS

Keywords: guard symbols; multiple antennas; OTFS; transmit diversity

Cite as: Dong Wang, Bule Sun, Fanggang Wang, Xiran Li, Pu Yuan, Dajie Jiang"Transmit Diversity Scheme Design for Rectangular Pulse Shaping Based OTFS"[J]China Communications,vol.19,no.3,pp.116-128,2022

### Internet of Lamps for Future Ubiquitous Communications: Integrated Sensing, Hybrid Interconnection, and Intelligent Illumination

Keywords: Internet of Lamps (IoL); integrated sensing; hybrid interconnection; intelligent illumination

Cite as: Fubin Wang, Xuan Huang, Fang Yang, Hui Yang, Jun Wang, Jian Song"Internet of Lamps for Future Ubiquitous Communications: Integrated Sensing, Hybrid Interconnection, and Intelligent Illumination"[J]China Communications,vol.19,no.3,pp.129-141,2022

### Eavesdropping Area for Evaluating the Security of Wireless Communications

Keywords: eavesdropping area; wireless communication; anti-eavesdropping performance; transmitting scheme

Cite as: Xiaofeng Zhong, Chenchen Fan, Shidong Zhou"Eavesdropping Area for Evaluating the Security of Wireless Communications"[J]China Communications,vol.19,no.3,pp.142-154,2022

### Deep Learning-Based Symbol Detection for Time-Varying Nonstationary Channels

Keywords: highly dynamic channel; deep neural network; long short-term memory; basis expansion model; symbol detection

Cite as: Xuantao Lyu, Wei Feng, Ning Ge, Xianbin Wang"Deep Learning-Based Symbol Detection for Time-Varying Nonstationary Channels"[J]China Communications,vol.19,no.3,pp.155-168,2022

### Autoencoder with Fitting Network for Terahertz Wireless Communications: A Deep Learning Approach

Keywords: Terahertz wireless communication; hybrid distortion; signal demodulation; autoencoder

Cite as: Zhaohui Huang, Dongxuan He, Jiakuan Chen, Zhaocheng Wang, Sheng Chen"Autoencoder with Fitting Network for Terahertz Wireless Communications: A Deep Learning Approach"[J]China Communications,vol.19,no.3,pp.169-177,2022

### Activity Detection for Enhanced Configured-Grant: A Practical Perspective

Keywords: configured-grant; massive access; activity detection

Cite as: Chenmin Sha, Shidong Zhou"Activity Detection for Enhanced Configured-Grant: A Practical Perspective"[J]China Communications,vol.19,no.3,pp.178-188,2022

### High Robust Broadcasting over DTMB-A with Low-rate LDPC Codes

Keywords: digital terrestrial/television multimedia broadcasting - advanced

核对

Cite as: Chao Zhang, Kewu Peng, Zhitong He, Yonglin Xue, Hui Yang"High Robust Broadcasting over DTMB-A with Low-rate LDPC Codes"[J]China Communications,vol.19,no.3,pp.189-198,2022

### Network Traffic Clustering with QoS-Awareness

Keywords: Network traffic clustering; quality-of-service; quality-of-experience; deep learning

Cite as: Jielun Zhang, Fuhao Li, Feng Ye\*"Network Traffic Clustering with QoS-Awareness"[J]China Communications,vol.19,no.3,pp.199-211,2022

### WSN Node Coverage Optimization Algorithm Based on Global and Neighborhood Difference DE

Keywords: differential evolution; the global topology; the neighborhood topology; diversity; wireless sensor network

Cite as: Yi Wang, Yubo Peng, Li Chen, Yanzhong Duan, Jing Li "WSN Node Coverage Optimization Algorithm Based on Global and Neighborhood Difference DE"[J]China Communications,vol.19,no.3,pp.212-226,2022

### Sensing Matrix Optimization for Multi-Target Localization Using Compressed Sensing in Wireless Sensor Network

Keywords: compressed sensing; hybrid metaheuristic; K-means clustering; multi-target localization;  $\lambda$ -averaged mutual coherence; sensing matrix optimization

Cite as: Xinhua Jiang, Ning Li, Yan Guo, Jie Liu, Cong Wang "Sensing Matrix Optimization for Multi-Target Localization Using Compressed Sensing in Wireless Sensor Network"[J]China Communications,vol.19,no.3,pp.227-241,2022

### An Efficient and Secure Aggregation Encryption Scheme in Edge Computing

Keywords: Edge computing; data aggregation; encryption; Simulated annealing

Cite as: Junhua Wu, Xiaofei Sheng, Guangshun Li, Kan Yu, Junke Liu "An Efficient and Secure Aggregation Encryption Scheme in Edge Computing"[J]China Communications,vol.19,no.3,pp.242-254,2022

### Multi-UAV Network Assisted Intelligent Edge Computing: Challenges and Opportunities

Keywords: multi-UAV cooperation; mobile edge computing; Internet-of-Things; UAV assistance

Cite as: Zhiwei Liu, Yang Cao, Peng Gao, Xinhai Hua, Dongcheng Zhang, Tao Jiang "Multi-UAV Network Assisted Intelligent Edge Computing: Challenges and Opportunities"[J]China Communications,vol.19,no.3,pp.255-275,2022

### A Novel Orthogonal LoRa Multiple Access Algorithm for Satellite Internet of Things

Keywords: LoRa; satellite Internet of Things; multiple access; fractional domain; linear frequency modulation

Cite as: Chengwen Zhang, Liankai Wang, Libin Jiao, Shipeng Wang, Jun Shi, Jia Yue "A Novel Orthogonal LoRa Multiple Access Algorithm for Satellite Internet of Things"[J]China Communications,vol.19,no.3,pp.276-286,2022

## April

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### Implementation Framework and Validation of Cluster-Nuclei Based Channel Model Using Environmental Mapping for 6G Communication Systems

Keywords: channel model; 6G; cluster-nuclei; environmental mapping; scatterer; ray-tracing; geometry-based stochastic model

Cite as: Li Yu, Yuxiang Zhang, Jianhua Zhang, Zhiqiang Yuan"Implementation Framework and Validation of Cluster-Nuclei Based Channel Model Using Environmental Mapping for 6G Communication Systems"[J]China Communications,vol.19,no.4,pp.1-13,2022

### Reliability-Optimal Pilot-Assisted Transmission for URLLC over Non-Reciprocal MISO Channels: TDD or FDD?

Keywords: URLLC; channel non-reciprocity; channel training; quantized feedback; Gaussian quadrature

Cite as: Yuncong Xie, Pinyi Ren"Reliability-Optimal Pilot-Assisted Transmission for URLLC over Non-Reciprocal MISO Channels: TDD or FDD?"[J]China Communications,vol.19,no.4,pp.14-27,2022

### Measurements and Characterization for the Vehicle-to-Infrastructure Channel in Urban and Highway Scenarios at 5.92GHz

Keywords: vehicle-to-infrastructure; channel characterization; measurement; urban scenario; highway scenario

Cite as: Yuanyuan Fan, Yi Feng, Liu Liu, Shuoshuo Dong, Zhaoyang Su, Jiahui Qiu, Xiaobo Lin "Measurements and Characterization for the Vehicle-to-Infrastructure Channel in Urban and Highway Scenarios at 5.92GHz"[J]China Communications,vol.19,no.4,pp.28-43,2022

### A MmWave Communication Testbed Based on IEEE 802.11ad with Scalable PtMP Configuration

Keywords: mmWave testbed; point-to-multi-point; IEEE 802.11ad

Cite as: Chaowei Wang, Mingliang Pang, Dinghui Zhong, Yuling Cui, Weidong Wang"A MmWave Communication Testbed Based on IEEE 802.11ad with Scalable PtMP Configuration"[J]China Communications,vol.19,no.4,pp.44-56,2022

### Joint Optimization Scheme Based on Beam Selection and Interference Cancellation in Lens Millimeter Wave NOMA Systems

Keywords: lens mmWave systems; NOMA; user clustering; beam selection; power allocation

Cite as: Lei Xu, Jing Cai, Jing Chang, Hongyu Fang, Xiaohui Li "Joint Optimization Scheme Based on Beam Selection and Interference Cancellation in Lens Millimeter Wave NOMA Systems"[J]China Communications,vol.19,no.4,pp.57-66,2022

### Joint Doppler Shift and Channel Estimation for UAV mmWave System with Massive ULA

Keywords: ULA; Doppler shift estimation; channel estimation; achievable sum rate

Cite as: Yanan Li, Yue Zhu, Tiankui Zhang, Dian Fan "Joint Doppler Shift and Channel Estimation for UAV mmWave System with Massive ULA"[J]China Communications,vol.19,no.4,pp.67-82,2022

### Joint Pilot Design and Beamforming Optimization in Massive MIMO Surveillance Systems

Keywords: proactive eavesdropping; massive MIMO; channel estimation; pilot contamination; beamforming

Cite as: Caihong Kai, Xiangru Zhang, Xinyue Hu, Wei Huang "Joint Pilot Design and Beamforming Optimization in Massive MIMO Surveillance Systems"[J]China Communications,vol.19,no.4,pp.83-97,2022

### A Novel Kind of Wideband Low-Profile Dielectric Resonator Antenna Suitable for Beam-scanning Applications

Keywords: dielectric resonator antenna; compact; wideband; beam-scanning; dual-polarization

Cite as: Wenjian Sun, Yang Yu, Yingdong Hu, Wenwen Yang, Jianxin Chen "A Novel Kind of Wideband Low-Profile Dielectric Resonator Antenna Suitable for Beam-scanning Applications"[J]China Communications,vol.19,no.4,pp.98-107,2022

### IRS-Aided SWIPT Systems with Power Splitting and Artificial Noise

Keywords: intelligent reflecting surface (IRS); passive beamforming; power splitting; SWIPT

Cite as: Baogang Li, Fuqiang Si, Dongsheng Han, Wujing Wu, "IRS-Aided SWIPT Systems with Power Splitting and Artificial Noise"[J]China Communications,vol.19,no.4,pp.108-120,2022

### Delay-Optimal Random Access in Large-Scale Energy Harvesting IoT Networks Based on Mean Field Game

Keywords: wireless communications; energy harvesting; random access; mean field game

Cite as: Dezhi Wang, Wei Wang, Zhaoyang Zhang, Aiping Huang "Delay-Optimal Random Access in Large-Scale Energy Harvesting IoT Networks Based on Mean Field Game"[J]China Communications,vol.19,no.4,pp.121-136,2022

### Collaborative Multiple Access And Energy-Efficient Resource Allocation in Distributed Maritime Wireless Networks

Keywords: maritime wireless networks; distributed multiple access; resource allocation; energy efficiency maximization

Cite as: Xueyan Cao, Hongming Zhang, Mugen Peng"Collaborative Multiple Access And Energy-Efficient Resource Allocation in Distributed Maritime Wireless Networks"[J]China Communications,vol.19,no.4,pp.137-153,2022

### Effective Methods and Performance Analysis on Data Transmission Security with Blind Source Separation in Space-Based AIS

Keywords: space-based automatic identification systems; tolerance rough set; particle swarm optimization; invulnerability performance

Cite as: Chengjie Li, Lidong Zhu, Zhongqiang Luo, Zhen Zhang, Ying Yang"Effective Methods and Performance Analysis on Data Transmission Security with Blind Source Separation in Space-Based AIS"[J]China Communications,vol.19,no.4,pp.154-165,2022

### Multi-Agent Few-Shot Meta Reinforcement Learning for Trajectory Design and Channel Selection in UAV-Assisted Networks

Keywords: UAV; trajectory design; channel selection; MADQN; meta reinforcement learning

Cite as: Shiyang Zhou, Yufan Cheng, Xia Lei, Huanhuan Duan"Multi-Agent Few-Shot Meta Reinforcement Learning for Trajectory Design and Channel Selection in UAV-Assisted Networks"[J]China Communications,vol.19,no.4,pp.166-176,2022

### Multi-Receiver Signcryption Scheme with Multiple Key Generation Centers through Public Channel in Edge Computing

Keywords: internet of things; signcryption; edge computing; unforgeability; confidentiality

Cite as: Lipeng Wang, Zhi Guan, Zhong Chen, Mingsheng Hu"Multi-Receiver Signcryption Scheme with Multiple Key Generation Centers through Public Channel in Edge Computing"[J]China Communications,vol.19,no.4,pp.177-198,2022

### Time-Critical Tasks Implementation in MEC Based Multi-Robot Cooperation Systems

Keywords: cooperative robots; mobile edge computing; energy consumption; resource management

Cite as: Rui Yin, Yineng Shen, Huawei Zhu, Xianfu Chen, Celimuge Wu"Time-Critical Tasks Implementation in MEC Based Multi-Robot Cooperation Systems"[J]China Communications,vol.19,no.4,pp.199-215,2022

### Delay Minimization for Intelligent Reflecting Surface Assisted Federated Learning

Keywords: federated learning; intelligent reflecting surface; latency minimization

Cite as: Ning Huang, Tianshun Wang, Yuan Wu, Suzhi Bi, Liping Qian, Bin Lin"Delay Minimization for Intelligent Reflecting Surface Assisted Federated Learning"[J]China Communications,vol.19,no.4,pp.216-229,2022

### Distributed Deep Learning for Cooperative Computation Offloading in Low Earth Orbit Satellite Networks

Keywords: LEO satellite networks; computation offloading; deep neural networks

Cite as: Qingqing Tang, Zesong Fei, Bin Li"Distributed Deep Learning for Cooperative Computation Offloading in Low Earth Orbit Satellite Networks"[J]China Communications,vol.19,no.4,pp.230-243,2022

### Intelligent Task Offloading and Collaborative Computation in Multi-UAV-Enabled Mobile Edge Computing

Keywords: mobile edge computing; multi-UAV; collaborative cloud and edge computing; deep neural network; differential evolution

Cite as: Jingming Xia, Peng Wang, Bin Li, Zesong Fei"Intelligent Task Offloading and Collaborative Computation in Multi-UAV-Enabled Mobile Edge Computing"[J]China Communications,vol.19,no.4,pp.244-256,2022

### Online Computation Offloading and Trajectory Scheduling for UAV-Enabled Wireless Powered Mobile Edge Computing

Keywords: energy efficiency; mobile edge computing; UAV-enabled; wireless power transfer; trajectory scheduling

Cite as: Han Hu, Xiang Zhou, Qun Wang, Rose Qingyang Hu"Online Computation Offloading and Trajectory Scheduling for UAV-Enabled Wireless Powered Mobile Edge Computing"[J]China Communications,vol.19,no.4,pp.257-273,2022

### Joint Optimization of Latency and Energy Consumption for Mobile Edge Computing Based Proximity Detection in Road Networks

Keywords: proximity detection; mobile edge computing; road networks; constrained multiobjective optimization

Cite as: Tongyu Zhao, Yaqiong Liu, Guochu Shou, Xinwei Yao"Joint Optimization of Latency and Energy Consumption for Mobile Edge Computing Based Proximity Detection in Road Networks"[J]China Communications,vol.19,no.4,pp.274-290,2022

### An Improved Convolutional Neural Network Based Indoor Localization by Using Jenks Natural Breaks Algorithm

Keywords: indoor localization; convolution neural network (CNN); Wi-Fi fingerprints; Jenks natural breaks

Cite as: Chengjie Hou, Yaqin Xie, Zhizhong Zhang"An Improved Convolutional Neural Network Based Indoor Localization by Using Jenks Natural Breaks Algorithm"[J]China Communications,vol.19,no.4,pp.291-301,2022

### Age of Transmission-Optimal Scheduling for State Update of Multi-Antenna Cellular Internet of Things

Keywords: age of transmission; information freshness; cellular IoT; restless multi-armed bandit; Whittle index

Cite as: Song Li, Min Li, Ruirui Chen, Yanjing Sun"Age of Transmission-Optimal Scheduling for State Update of Multi-Antenna Cellular Internet of Things"[J]China Communications,vol.19,no.4,pp.302-314,2022

## May

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### Joint Optimization of Communications and Computing Resources Allocation for Deterministic Transmission in Wireless Edge Networks

Keywords: mobile edge computing; deterministic transmission; delay and jitter; resource allocation

Cite as: Lanjing Chen, Zhiyong Chen, Bin Xia, Xin Jiang, Feng Hu"Joint Optimization of Communications and Computing Resources Allocation for Deterministic Transmission in Wireless Edge Networks"[J]China Communications,vol.19,no.5,pp.1-11,2022

### Cognitive RAN Slicing Resource Allocation Based on Stackelberg Game

Keywords: \label{abstract}The cognitive network has become a promising method to solve the spectrum resources shortage problem. Especially for the optimization of network slicing resources in

the cognitive radio access network (RAN), we are interested in the profit of the mobile virtual network operator (MVNO) and the utility of secondary users (SUs). In cognitive RAN, we aim to find the optimal scheme for the MVNO to efficiently allocate slice resources to SUs. Since the MVNO and SUs are selfish and the game between the MVNO and SUs is difficult to reach equilibrium, we consider modeling this scheme as a Stackelberg game. Leveraging mathematical programming with equilibrium constraints (MPEC) and Karush-Kuhn-Tucker (KKT) conditions, we can obtain a single-level optimization problem, and then prove that the problem is a convex optimization problem. The simulation results show that the proposed method is superior to the non-cooperative game. While guaranteeing the Quality of Service (QoS) of primary users (PUs) and SUs, the proposed method can balance the profit of the MVNO and the utility of SUs. cognitive RAN; network slicing; MVNO; Stackelberg game; MPEC; KKT

Cite as: [Tengteng Ma, Yong Zhang, Siyu Yuan, Zhenjie Cheng "Cognitive RAN Slicing Resource Allocation Based on Stackelberg Game" \[J\]China Communications, vol.19, no.5, pp.12-23, 2022](#)

### **Asymptotic Analysis and Precoding Design of Integrated Access and Backhaul in Full-Duplex mmWave Networks**

Keywords: millimeter wave; full duplex; integrated access and backhaul; precoding

Cite as: [Yi Zhang, Shuai Han, Weixiao Meng, Xunan Li, Yue Chen "Asymptotic Analysis and Precoding Design of Integrated Access and Backhaul in Full-Duplex mmWave Networks" \[J\]China Communications, vol.19, no.5, pp.24-45, 2022](#)

### **Linear Network Coding Based Fast Data Synchronization for Wireless Ad Hoc Networks with Controlled Topology**

Keywords: all-to-all broadcast; data synchronization; distributed system; network coding; wireless ad hoc network; UAV.

Cite as: [Die Hu, Xuejun Zhu, Min Gong, Shaoshi Yang "Linear Network Coding Based Fast Data Synchronization for Wireless Ad Hoc Networks with Controlled Topology" \[J\]China Communications, vol.19, no.5, pp.46-53, 2022](#)

### **Bit-Interleaved Polar Coded Modulation with Iterative Successive Cancellation List Decoding**

Keywords: BIPCM-ID; Polar code; SCMA; Re-encoder; SCL; AMI

Cite as: [Hang Mu, Zheng Ma, George K. Karagiannidis, Panagiotis D. Diamantoulakis "Bit-Interleaved Polar Coded Modulation with Iterative Successive Cancellation List Decoding" \[J\]China Communications, vol.19, no.5, pp.54-68, 2022](#)

### Jitter Enhanced Full Digital RF Transmitter and PWM RFPA for 5G Broadband Communications

Keywords: PWM RFPA; OFDM; jitter; 256QAM; EVM

Cite as: Linxin Yin, Dake Liu, Yong Bai"Jitter Enhanced Full Digital RF Transmitter and PWM RFPA for 5G Broadband Communications"[J]China Communications,vol.19,no.5,pp.69-86,2022

### Tradeoffs in Covert Wireless Communication with a Controllable Full-Duplex Receiver

Keywords: covert communication; multi-objective optimization; full-duplex; resource allocation

Cite as: Yue Zhao, Zan Li, Danyang Wang, Nan Cheng"Tradeoffs in Covert Wireless Communication with a Controllable Full-Duplex Receiver"[J]China Communications,vol.19,no.5,pp.87-101,2022

### A Uniform Reference Line Based Differential Phase Shifter with Wide Phase Range and Wide Bandwidth

Keywords: differential phase shifter; uniform reference line; wideband; wide phase range; vertically installed planar

Cite as: Canrong Fu, Bowei Xu, Shaoyong Zheng"A Uniform Reference Line Based Differential Phase Shifter with Wide Phase Range and Wide Bandwidth"[J]China Communications,vol.19,no.5,pp.102-111,2022

### Elliptical Cell Based Beamforming Design with an Improved $\beta$ -Fairness Power Allocation for HSR Communication Systems

Keywords: high-speed railway communication; elliptical cell based beamforming; coverage; power allocation; mobile service amount

Cite as: Ximei Liu, Deli Qiao"Elliptical Cell Based Beamforming Design with an Improved  $\beta$ -Fairness Power Allocation for HSR Communication Systems"[J]China Communications,vol.19,no.5,pp.112-128,2022

### A Physical Layer Authentication Mechanism for IoT Devices

Keywords: IoT; CSI; CNN; access authentication; intrusion detection

Cite as: Xinglu Li, Kaizhi Huang, Shaoyu Wang, Xiaoming Xu"A Physical Layer Authentication Mechanism for IoT Devices"[J]China Communications,vol.19,no.5,pp.129-140,2022

### DDoS Detection for 6G Internet of Things: Spatial-Temporal Trust Model and New Architecture

Keywords: sixth generation (6G) network; internet of things (IoT); trust model; distributed denial of service (DDoS)

Cite as: Yinglun Ma, Xu Chen, Wei Feng, Ning Ge"DDoS Detection for 6G Internet of Things: Spatial-Temporal Trust Model and New Architecture"[J]China Communications,vol.19,no.5,pp.141-149,2022

### Real-Time Monitoring System for Rotor Temperature of a Large Turbogenerator Based on SmartMesh IP Wireless Network Communication Technology

Keywords: SmartMesh IP; wireless network communication; turbine generator; rotor temperature; real-time monitoring

Cite as: Zhiting Zhou, Hui Li, Yong Yang, Haibo Zhang, Zhennan Fan"Real-Time Monitoring System for Rotor Temperature of a Large Turbogenerator Based on SmartMesh IP Wireless Network Communication Technology"[J]China Communications,vol.19,no.5,pp.150-163,2022

### Sharing of Encrypted Lock Keys in the Blockchain-Based Renting House System from Time- and Identity-Based Proxy Reencryption

Keywords: identity-based proxy reencryption; time stamp; renting houses system; blockchain

Cite as: Zhiwei Wang, Liping Qian, Danwei Chen, Guozi sun"Sharing of Encrypted Lock Keys in the Blockchain-Based Renting House System from Time- and Identity-Based Proxy Reencryption"[J]China Communications,vol.19,no.5,pp.164-177,2022

### Dynamic Backup Sharing Scheme of Service Function Chains in NFV

Keywords: network function virtualization; service function chain mapping; reliability; backup sharing

Cite as: Dong Zhang, Zhifan Zheng, Xiang Lin, Xiang Chen, Chunming Wu"Dynamic Backup Sharing Scheme of Service Function Chains in NFV"[J]China Communications,vol.19,no.5,pp.178-190,2022

### Joint Trajectory and Passive Beamforming Optimization in IRS-UAV Enhanced Anti-Jamming Communication Networks

Keywords: intelligent reflecting surface; unmanned aerial vehicle; deep reinforcement learning; trajectory optimization

Cite as: Zhifeng Hou, Jin Chen, Yuzhen Huang, Yijie Luo, Ximing Wang, Jiangchun Gu, Yifan Xu,\\Kailing Yao"Joint Trajectory and Passive Beamforming Optimization in IRS-UAV Enhanced Anti-Jamming Communication Networks"[J]China Communications,vol.19,no.5,pp.191-205,2022

### Resource Allocation and Trajectories Design for UAV-Assisted Jamming Cognitive UAV Networks

Keywords: cognitive radio; unmanned aerial vehicles communications; physical layer security; cooperative jamming

Cite as: Zhenhui Tao, Fuhui Zhou, Yuhao Wang, Xiaodong Liu, Qihui Wu"Resource Allocation and Trajectories Design for UAV-Assisted Jamming Cognitive UAV Networks"[J]China Communications,vol.19,no.5,pp.206-217,2022

### Anti-Attacking Modeling and Analysis of Cyberspace Mimic DNS

Keywords: cyberspace mimic DNS; generalized stochastic Petri net; anti-attacking; modeling; performance

Cite as: Lei He, Quan Ren, Bolin Ma, Weili Zhang, Jiangxing Wu"Anti-Attacking Modeling and Analysis of Cyberspace Mimic DNS"[J]China Communications,vol.19,no.5,pp.218-230,2022

### Large Spacing Array with Offset Phase Center Elements for Highly Integrated Applications

Keywords: massive array; offset phase center array; grating lobe reduction; genetic algorithm; multi-mode circular patch

Cite as: Hailing Jiang, Hui Tian, Shubo Dun, Junyi Zhang"Large Spacing Array with Offset Phase Center Elements for Highly Integrated Applications"[J]China Communications,vol.19,no.5,pp.231-240,2022

### Collision Classification MAC Protocol for Underwater Acoustic Communication Networks Using Directional Antennas

Keywords: collision classification; directional antennas; dual channel; media access control (MAC); underwater acoustic communication networks (UACNs)

Cite as: Jianmin Yang, Gang Qiao, Qing Hu, Lingji Xu, Peng Xiao, Jiarong Zhang"Collision Classification MAC Protocol for Underwater Acoustic Communication Networks Using Directional Antennas"[J]China Communications,vol.19,no.5,pp.241-252,2022

### Solve the False-Positive Problem of the Mimic System Based on the Best Mimic Component Set

Keywords: mimic scope; the best mimic component set; false-positive rate; mimic transformation

Cite as: Yuwen Shao, Zheng Zhang , Xiaomei Wang, Chuanxing Pan, Jiangxing Wu"Solve the False-Positive Problem of the Mimic System Based on the Best Mimic Component Set"[J]China Communications,vol.19,no.5,pp.253-266,2022

### Demand Prediction Based Slice Reconfiguration Using Dueling Deep Q-Network

Keywords: network slicing; slice reconfiguration; reinforcement learning; resource allocation

Cite as: Wanqing Guan, Haijun Zhang"Demand Prediction Based Slice Reconfiguration Using Dueling Deep Q-Network"[J]China Communications,vol.19,no.5,pp.267-285,2022

### Attention-Based Multi-Scale Prediction Network for Time-Series Data

Keywords: network traffic prediction; attention mechanism; neural network; machine learning; single point forecast

Cite as: Junjie Li, Lin Zhu, Yong Zhang, Da Guo, Xingwen Xia"Attention-Based Multi-Scale Prediction Network for Time-Series Data"[J]China Communications,vol.19,no.5,pp.286-301,2022

### Adaptive 3D Routing Protocol for Flying Ad Hoc Networks Based on Prediction-Driven Q-Learning

Keywords: routing; unmanned aerial vehicles (UAVs); flying ad hoc networks (FANETs); prediction; Q-Learning

Cite as: Min Zhang, Chao Dong, Simeng Feng, Xin Guan, Huichao Chen, Qihui Wu"Adaptive 3D Routing Protocol for Flying Ad Hoc Networks Based on Prediction-Driven Q-Learning"[J]China Communications,vol.19,no.5,pp.302-317,2022

### Coverage Analyses on Directional Transmissions Ultra-Dense Networks with Imperfect Beam Alignment

Keywords: imperfect beam alignment; directional transmission; ultra-dense networks; stochastic geometry

Cite as: Yining Xu, Sheng Zhou"Coverage Analyses on Directional Transmissions Ultra-Dense Networks with Imperfect Beam Alignment"[J]China Communications,vol.19,no.5,pp.318-328,2022

## June

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### A Novel Pipelining Encryption Hardware System with High Throughput and High Integration for 5G

Keywords: encryption hardware system for 5G; ZUC-256 stream cipher algorithm; pipeline scheme; throughput rate; integration rate

Cite as: Yuntao Liu, Zesheng Shen, Shuo Fang, Yun Wang"A Novel Pipelining Encryption Hardware System with High Throughput and High Integration for 5G"[J]China Communications,vol.19,no.6,pp.1-10,2022

### Differential Privacy Preserving Dynamic Data Release Scheme Based on Jensen-Shannon Divergence

Keywords: differential privacy; dynamic data release; Jensen-Shannon divergence

Cite as: Ying Cai, Yu Zhang, Jingjing Qu, Wenjin Li "Differential Privacy Preserving Dynamic Data Release Scheme Based on Jensen-Shannon Divergence"[J]China Communications,vol.19,no.6,pp.11-21,2022

### Achieving Fine-Grained and Flexible Access Control on Blockchain-Based Data Sharing for the Internet of Things

Keywords: blockchain; access control; smart contract; multi-signature; chameleon-hash; data sharing; Internet of Things

Cite as: Ruimiao Wang, Xiaodong Wang, Wenti Yang, Shuai Yuan, Zhitao Guan "Achieving Fine-Grained and Flexible Access Control on Blockchain-Based Data Sharing for the Internet of Things"[J]China Communications,vol.19,no.6,pp.22-34,2022

### Fine-Grained and Fair Identity Authentication Scheme for Mobile Networks Based on Blockchain

Keywords: identity authentication; secret sharing; chameleon hash; redactable blockchain

Cite as: Mengjuan Zhai, Yanli Ren, Guorui Feng, Xinpeng Zhang "Fine-Grained and Fair Identity Authentication Scheme for Mobile Networks Based on Blockchain"[J]China Communications,vol.19,no.6,pp.35-49,2022

### Proximal Policy Optimization-Based Committee Selection Algorithm in Blockchain-Enabled Mobile Edge Computing Systems

Keywords: blockchain; mobile edge computing; deep reinforcement learning; consensus mechanism

Cite as: Wenjun Wu, Dehao Sun, Kaiqi Jin, Yang Sun, Pengbo Si "Proximal Policy Optimization-Based Committee Selection Algorithm in Blockchain-Enabled Mobile Edge Computing Systems"[J]China Communications,vol.19,no.6,pp.50-65,2022

### BC-AKA: Blockchain Based Asymmetric Authentication and Key Agreement Protocol for Distributed 5G Core Network

Keywords: blockchain; asymmetric authentication; key agreement; distributed core network; 5G

Cite as: Zhen Gao, Dongbin Zhang, Jiuzhi Zhang, Zhao Liu, Haoming Liu, Ming Zhao "BC-AKA: Blockchain Based Asymmetric Authentication and Key Agreement Protocol for Distributed 5G Core Network"[J]China Communications,vol.19,no.6,pp.66-76,2022

### PUMTD: Privacy-Preserving User-Profile Matching Protocol in Social Networks

Keywords: user profile matching; Chinese remainder theorem; privacy-preserving; query privacy

Cite as: Jianhong Zhang, Haoting Han, Hongwei Su , Zhengtao Jiang\*, Changgen Peng "PUMTD: Privacy-Preserving User-Profile Matching Protocol in Social Networks"[J]China Communications,vol.19,no.6,pp.77-90,2022

### An Efficient and Privacy-Preserving Data Aggregation Scheme Supporting Arbitrary Statistical Functions in IoT

Keywords: Internet of Things; data aggregation; privacy protection; arbitrary aggregation functions

Cite as: Haihui Liu, Jianwei Chen, Liwei Lin, Ayong Ye, Chuan Huang"An Efficient and Privacy-Preserving Data Aggregation Scheme Supporting Arbitrary Statistical Functions in IoT"[J]China Communications,vol.19,no.6,pp.91-104,2022

### A Predictive 6G Network with Environment Sensing Enhancement: From Radio Wave Propagation Perspective

Keywords: 6G network; electromagnetic waves propagation characteristics prediction; environment information sensing enhancement

Cite as: Gaofeng Nie, Jianhua Zhang, Yuxiang Zhang, Li Yu, Zhen Zhang, Yutong Sun, Lei Tian, Qixing Wang, Liang Xia"A Predictive 6G Network with Environment Sensing Enhancement: From Radio Wave Propagation Perspective"[J]China Communications,vol.19,no.6,pp.105-122,2022

### 6G Mobile Network Requirements and Technical Feasibility Study

Keywords: 6G; key performance indicator (KPI); requirement; technical feasibility; visible light communication (VLC); reconfigurable intelligent surface (RIS)

Cite as: Yuhong Huang, Jing Jin, Mengting Lou, Jing Dong, Dan Wu, Liang Xia, Sen Wang, Xiaozhou Zhang "6G Mobile Network Requirements and Technical Feasibility Study"[J]China Communications,vol.19,no.6,pp.123-136,2022

### Cognitive Intelligence Based 6G Distributed Network Architecture

Keywords: cognitive intelligence; service-based architecture; physical network layer; intelligent decision layer

Cite as: Xiaodong Duan, Tao Sun, Chao Liu, Xiao Ma, Zheng Hu, Lu Lu, Chunhong Zhang, Benhui Zhuang, Weiyuan Li, Shangguang Wang"Cognitive Intelligence Based 6G Distributed Network Architecture"[J]China Communications,vol.19,no.6,pp.137-153,2022

### Signal Clipping at Transmitter and Receiver of O-OFDM for VLC under Optical Power Constraint

Keywords: 6G; visible light communications; optical orthogonal frequency division multiplexing; clipping; bit error rate; throughput

Cite as: Liang Xia, Xiaoqian Wang, Zhiwen Sun, Zhitian Cheng, Jing Jin, Yifei Yuan, Guangyi Liu, Tao Jiang, Yuhong Huang"Signal Clipping at Transmitter and Receiver of O-OFDM for VLC under Optical Power Constraint"[J]China Communications,vol.19,no.6,pp.154-168,2022

### Time Efficient Joint Optimization Federated Learning over Wireless Communication Networks

Keywords: 6G; native AI; FL; network architecture; resource allocation

Cite as: Junshuai Sun, Yingying Wang, Xin Sun, Na Li, Gaofeng Nie"Time Efficient Joint Optimization Federated Learning over Wireless Communication Networks"[J]China Communications,vol.19,no.6,pp.169-178,2022

### User-Level Scheduling and Resource Allocation for Multi-Beam Satellite Systems with Full Frequency Reuse

Keywords: multi-beam satellite; full frequency reuse; inter-beam interference; latency optimization; deep reinforcement learning

Cite as: Tao Leng, Yanan Wang, Dongwei Hu, Gaofeng Cui, Weidong Wang"User-Level Scheduling and Resource Allocation for Multi-Beam Satellite Systems with Full Frequency Reuse"[J]China Communications,vol.19,no.6,pp.179-192,2022

### Codebook Design and Beam Training for Extremely Large-Scale RIS: Far-Field or Near-Field?

Keywords: extremely large-scale RIS; near-field codebook design; beam training

Cite as: Xiuhong Wei, Linglong Dai , Yajun Zhao, Guanghui Yu, Xiangyang Duan"Codebook Design and Beam Training for Extremely Large-Scale RIS: Far-Field or Near-Field?"[J]China Communications,vol.19,no.6,pp.193-204,2022

### Joint Access Point Selection and Resource Allocation in MEC-Assisted Network: A Reinforcement Learning Based Approach

Keywords: mobile edge computing; joint resource allocation; reinforcement learning

Cite as: Zexu Li, Chunjing Hu, Wenbo Wang, Yong Li, Guiming Wei"Joint Access Point Selection and Resource Allocation in MEC-Assisted Network: A Reinforcement Learning Based Approach"[J]China Communications,vol.19,no.6,pp.205-218,2022

### Hybrid Marine Predators Optimization and Improved Particle Swarm Optimization-Based Optimal Cluster Routing in Wireless Sensor Networks (WSNs)

Keywords: Marine Predators Optimization Algorithm (MPOA); Particle Swarm Optimization (PSO); Optimal Cluster-based Routing; Cluster Head (CH) selection; Wireless Sensor Networks (WSNs)  
Cite as: A. Balamurugan, Sengathir Janakiraman, M. Deva Priya, A. Christy Jeba Malar "Hybrid Marine Predators Optimization and Improved Particle Swarm Optimization-Based Optimal Cluster Routing in Wireless Sensor Networks (WSNs)"[J]China Communications,vol.19,no.6,pp.219-247,2022

### Minimizing Outage Probability Driven Wireless Backhaul Scheme in Heterogeneous Networks

Keywords: HetNets; wireless backhaul; NOMA; outage probability; backhaul capacity  
Cite as: Zhenxing Li, Rui Xie, Kai Luo, Tao Jiang"Minimizing Outage Probability Driven Wireless Backhaul Scheme in Heterogeneous Networks"[J]China Communications,vol.19,no.6,pp.248-262,2022

### Analyzing and De-Anonymizing Bitcoin Networks: An IP Matching Method with Clustering and Heuristics

Keywords: Bitcoin; blockchain; de-anonymization; heuristics  
Cite as: Teng Long, Jiasheng Xu, Luoyi Fu, Xinbing Wang"Analyzing and De-Anonymizing Bitcoin Networks: An IP Matching Method with Clustering and Heuristics"[J]China Communications,vol.19,no.6,pp.263-278,2022

### Application of Brain-Computer-Interface in Awareness Detection Using Machine Learning Methods

Keywords: brain-computer interface; EEG; awareness detection; machine learning; deep learning  
Cite as: Kaiqiang Feng, Weilong Lin, Feng Wu, Chengxin Pang, Liang Song, Yijia Wu, Rong Cao, Huiliang Shang, Xinhua Zeng"Application of Brain-Computer-Interface in Awareness Detection Using Machine Learning Methods"[J]China Communications,vol.19,no.6,pp.279-291,2022

## July

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### Performance Analysis of Spectrum Sensing Based on Distributed Satellite Clusters under Perturbation

Keywords: spectrum sensing; beamforming; distributed satellite clusters; shadowed-Rician fading;  
Cite as: Yunfeng Wang, Xiaojin Ding, Tao Hong, Gengxin Zhang"Performance Analysis of Spectrum Sensing Based on Distributed Satellite Clusters under Perturbation"[J]China Communications,vol.19,no.7,pp.1-12,2022

### Dynamic Spectrum Access Based on Prior Knowledge Enabled Reinforcement Learning with Double Actions in Complex Electromagnetic Environment

Keywords: prior knowledge; reinforcement learning; anti-jamming communication; spectrum access

Cite as: Linghui Zeng, Fuqiang Yao, Jianzhao Zhang, Min Jia "Dynamic Spectrum Access Based on Prior Knowledge Enabled Reinforcement Learning with Double Actions in Complex Electromagnetic Environment"[J]China Communications,vol.19,no.7,pp.13-24,2022

### Improving SINR via Joint Beam and Power Management for GEO and LEO Spectrum-Sharing Satellite Communication Systems

Keywords: beam management; deep Q-network; GEO-LEO coexisting; power allocation

Cite as: Xiaojin Ding, Zhuangzhuang Ren, Huanbin Lu, Gengxin Zhang "Improving SINR via Joint Beam and Power Management for GEO and LEO Spectrum-Sharing Satellite Communication Systems"[J]China Communications,vol.19,no.7,pp.25-36,2022

### Anti-Jamming Trajectory Design for UAV-Enabled Wireless Sensor Networks Using Communication Flight Corridor

Keywords: UAV; data collection; jamming environment; path planning; trajectory optimization

Cite as: Binbin Wu, Bangning Zhang, Daoxing Guo, Hongbin Wang, Hao Jiang "Anti-Jamming Trajectory Design for UAV-Enabled Wireless Sensor Networks Using Communication Flight Corridor"[J]China Communications,vol.19,no.7,pp.37-52,2022

### Secure Transmission in Satellite-UAV Integrated System Against Eavesdropping and Jamming: A Two-Level Stackelberg Game Model

Keywords: physical layer security; secure transmission; satellite-UAV system; Stackelberg game

Cite as: Chengjian Liao, Kui Xu, Hongpeng Zhu, Xiaochen Xia, Qiao Su, Nan Sha "Secure Transmission in Satellite-UAV Integrated System Against Eavesdropping and Jamming: A Two-Level Stackelberg Game Model"[J]China Communications,vol.19,no.7,pp.53-66,2022

### An Energy-Efficient UAV Deployment Scheme for Emergency Communications in Air-Ground Networks with Joint Trajectory and Power Optimization

Keywords: SAGIN; UAV; energy efficiency (EE) maximization; trajectory optimization; power allocation

Cite as: Shuo Zhang, Shuo Shi, Weizhi Wang, Zhenyu Xu, Xuemai Gu "An Energy-Efficient UAV Deployment Scheme for Emergency Communications in Air-Ground Networks with Joint Trajectory and Power Optimization"[J]China Communications,vol.19,no.7,pp.67-78,2022

### Independent Vector Analysis Based Blind Interference Reduction and Signal Recovery for MIMO IoT Green Communications

Keywords: independent vector analysis; blind source separation; MIMO; green communications

Cite as: Zhongqiang Luo, Mingchun Li, Chengjie Li "Independent Vector Analysis Based Blind Interference Reduction and Signal Recovery for MIMO IoT Green Communications"[J]China Communications,vol.19,no.7,pp.79-88,2022

### Intelligent Blind Source Separation Technology Based on OTFS Modulation for LEO Satellite Communication

Keywords: LEO; Doppler effect; Delay-Doppler domain; OTFS; DBSCAN clustering algorithm

Cite as: Chengjie Li, Lidong Zhu, Cheng Guo, Tao Liu, Zhen Zhang "Intelligent Blind Source Separation Technology Based on OTFS Modulation for LEO Satellite Communication"[J]China Communications,vol.19,no.7,pp.89-99,2022

### Deep Unfolding for Cooperative Rate Splitting Multiple Access in Hybrid Satellite Terrestrial Networks

Keywords: hybrid satellite terrestrial network; rate splitting multiple access; cooperative transmission; deep unfolding; weighted minimum mean square error

Cite as: Qingmiao Zhang, Lidong Zhu, Shan Jiang, Xiaogang Tang "Deep Unfolding for Cooperative Rate Splitting Multiple Access in Hybrid Satellite Terrestrial Networks"[J]China Communications,vol.19,no.7,pp.100-109,2022

### A Public Blockchain Consensus Mechanism for Fault-Tolerant Distributed Computing in LEO Satellite Communications

Keywords: distributed computing; public blockchain network; consensus mechanism; credibility; fault-tolerance

Cite as: Zhen Zhang, Bing Guo, Lidong Zhu, Yan Shen, Chaoxia Qin, Chengjie Li "A Public Blockchain Consensus Mechanism for Fault-Tolerant Distributed Computing in LEO Satellite Communications"[J]China Communications,vol.19,no.7,pp.110-123,2022

### Design of Multichannel Adaptive Filter by Constructing Multidimensional Wiener-Hopf Equation

Keywords: satellite-ground data transmission link; symbol

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Cite as: Zhisong Hao, Chaoyu He, Min Jia, Leilei Wu"Design of Multichannel Adaptive Filter by Constructing Multidimensional Wiener-Hopf Equation"[J]China Communications,vol.19,no.7,pp.124-134,2022

### Parameter Estimation of Multiple Frequency-Hopping Signals Based on Space-Time-Frequency Analysis by Atomic Norm Soft Thresholding with Missing Observations

Keywords: frequency hopping; parameter estimation; missing observations; atomic norm soft thresholding; uniform linear array

Cite as: Hongbin Wang, Bangning Zhang, Heng Wang, Binbin Wu, Daoxing Guo"Parameter Estimation of Multiple Frequency-Hopping Signals Based on Space-Time-Frequency Analysis by Atomic Norm Soft Thresholding with Missing Observations"[J]China Communications,vol.19,no.7,pp.135-151,2022

### ReLFA: Resist Link Flooding Attacks via Renyi Entropy and Deep Reinforcement Learning in SDN-IoT

Keywords: link flooding attacks; renyi entropy; deep reinforcement learning

Cite as: Jiushuang Wang, Ying Liu, Weiting Zhang, Xincheng Yan, Na Zhou, Zhihong Jiang"ReLFA: Resist Link Flooding Attacks via Renyi Entropy and Deep Reinforcement Learning in SDN-IoT"[J]China Communications,vol.19,no.7,pp.152-166,2022

### Never Lost Keys: A Novel Key Generation Scheme Based on Motor Imagery EEG in End-Edge-Cloud System

Keywords: EEG; biometric key generation; end-edge-cloud system; information security

Cite as: Yichuan Wang, Dan Wu, Xiaoxue Liu, Xinhong Hei"Never Lost Keys: A Novel Key Generation Scheme Based on Motor Imagery EEG in End-Edge-Cloud System"[J]China Communications,vol.19,no.7,pp.167-179,2022

### A One-Time Pad Encryption Scheme Based on Efficient Physical-Layer Secret Key Generation for Intelligent IoT System

Keywords: physical layer security; intelligent internet of things; one-time pad; reconfigurable intelligent surface

Cite as: Liquan Chen, Kailin Cao, Tianyu Lu, Yi Lu, Aiqun Hu "A One-Time Pad Encryption Scheme Based on Efficient Physical-Layer Secret Key Generation for Intelligent IoT System"[J]China Communications,vol.19,no.7,pp.180-191,2022

### **RUAP: Random Rearrangement Block Matrix-Based Ultra-Lightweight RFID Authentication Protocol for End-Edge-Cloud Collaborative Environment**

Keywords: end-edge-cloud orchestration; mutual authentication; ultra-lightweight; RFID; random rearrangement block matrix; IoT

Cite as: Yu Luo, Kai Fan, Xingmiao Wang, Hui Li, Yintang Yang "RUAP: Random Rearrangement Block Matrix-Based Ultra-Lightweight RFID Authentication Protocol for End-Edge-Cloud Collaborative Environment"[J]China Communications,vol.19,no.7,pp.192-208,2022

### **MEC Enabled Cooperative Sensing and Resource Allocation for Industrial IoT Systems**

Keywords: industrial Internet of Things; cooperative sensing; MEC; random delay

Cite as: Yanpeng Dai, Lihong Zhao, Ling Lyu "MEC Enabled Cooperative Sensing and Resource Allocation for Industrial IoT Systems"[J]China Communications,vol.19,no.7,pp.209-220,2022

### **Efficient Multi-User for Task Offloading and Server Allocation in Mobile Edge Computing Systems**

Keywords: distributed unsupervised learning; energy efficiency; mobile edge computing; task offloading

Cite as: Qiuming Liu , Jing Li, Jianming Wei, Ruoxuan Zhou, Zheng Chai, Shumin Liu "Efficient Multi-User for Task Offloading and Server Allocation in Mobile Edge Computing Systems"[J]China Communications,vol.19,no.7,pp.221-233,2022

### **Stochastic Learning for Opportunistic Peer-to-Peer Computation Offloading in IoT Edge Computing**

Keywords: Internet of Things (IoT); edge computing; opportunistic; peer-to-peer; computation offloading; stochastic game; online learning

Cite as: Siqi Mu, Yanfei Shen@bsu.edu.cn} "Stochastic Learning for Opportunistic Peer-to-Peer Computation Offloading in IoT Edge Computing"[J]China Communications,vol.19,no.7,pp.234-251,2022

### **Achieving Fuzzy Matching Data Sharing for Secure Cloud-Edge Communication**

Keywords: fuzzy-matching; privacy-preserving set intersection; cloud-edge communication; data sharing

Cite as: Chuan Zhang, Mingyang Zhao, Yuhua Xu, Tong Wu, Yanwei Li, Liehuang Zhu, Haotian Wang "Achieving Fuzzy Matching Data Sharing for Secure Cloud-Edge Communication"[J]China Communications,vol.19,no.7,pp.252-271,2022

### Age-Constrained Dynamic Content Replacing and Delivering for UAV-Assisted Context Awareness

Keywords: UAV offloading; context awareness; on-board caching; cache replacing; content freshness

Cite as: Liudi Wang, Shan Zhang, Xishuo Li, Hongbin Luo "Age-Constrained Dynamic Content Replacing and Delivering for UAV-Assisted Context Awareness"[J]China Communications,vol.19,no.7,pp.272-288,2022

### Privacy-Preserving Incentive Mechanism for Platoon Assisted Vehicular Edge Computing with Deep Reinforcement Learning

Keywords: vehicular edge computing; Stackelberg game; deep reinforcement learning.

Cite as: Xumin Huang, Yupei Zhong, Yuan Wu, Peichun Li, Rong Yu "Privacy-Preserving Incentive Mechanism for Platoon Assisted Vehicular Edge Computing with Deep Reinforcement Learning"[J]China Communications,vol.19,no.7,pp.289-304,2022

### Towards Task-Free Privacy-Preserving Data Collection

Keywords: IoT; privacy protection; data collection; adversarial learning; deep learning

Cite as: Zhibo Wang, Wei Yuan, Xiaoyi Pang, Jingxin Li, Huajie Shao "Towards Task-Free Privacy-Preserving Data Collection"[J]China Communications,vol.19,no.7,pp.305-318,2022

### Adaptive Learning-Based Delay-Sensitive and Secure Edge-End Collaboration for Multi-Mode Low-Carbon Power IoT

Keywords: multi-mode low-carbon PIIoT; edge-end collaboration; multi-attribute QoS guarantee; security enhancement; adaptive deep actor-critic

Cite as: Haijun Liao, Zehan Jia, Ruiqiuyu Wang, Zhenyu Zhou, Fei Wang, Dongsheng Han, Guangyuan Xu, Zhenti Wang, Yan Qin "Adaptive Learning-Based Delay-Sensitive and Secure Edge-End Collaboration for Multi-Mode Low-Carbon Power IoT"[J]China Communications,vol.19,no.7,pp.319-331,2022