Table of Contents

Preface .................................................................................................................................................................................................................. xx
WCSP 2022 Committee ........................................................................................................................................................................... xx

AI and Blockchain Enabled Communications and Security Symposium

Distributed RISs-Aided Secure Wireless Network Under Practical Phase Shift Model: A Deep Reinforcement Learning Approach ................................................................................................................................................................................................. 1

Zhibo Zhang, Li Li

Block Propagation in Blockchain-Based 6G Network: From a Communication Perspective ................................................................. 6

Yisong Wang, Xuefei Zhang, Xiaochen Wang, Qimei Cui, Xiaofeng Tao

Location-Based Reliable Sharding in Blockchain-Enabled Fog Computing Networks .............................................................................. 12

Xiaoge Huang, Hongbo Yin, Yongsheng Wang, Qianbin Chen, Jie Zhang

GaS-PBFT: A Game-based Node Selection Consensus Mechanism for Internet of Things ................................................................. 17

Yiheng Jiang, Yuwei Le, Jiaheng Wang, Xiaohu You

Application-Based Cooperative Content Caching via Tensor Domain Adaptation Networks ........................................................................ 22

Yanlong Wang, Youjia Chen, Pingping Chen, Jinsong Hu, Haifeng Zheng

Power Coverage Optimization in Cellular Radio Networks Using Neural Architecture Search ................................................................ 28

Juan Zhu, Tianyu Wang, Zhe Xiao, Shaowei Wang

Blockchain-enabled Edge Computing Framework for Hierarchic Cluster-based Federated Learning ................................................................. 33

Xiaoge Huang, Yuhang Wu, Zhi Chen, Qianbin Chen, Jie Zhang

Joint Mining Offloading and Computing Resource Optimization in Mobile Blockchain System ........................................................................ 38

Shan Sun, Wei Wang, Wenjing Xu, Jia Guo

A Deep Reinforcement Learning Approach for Multi-UAV-Assisted Data Collection in Wireless Powered IoT Networks ................................................................................................................................................................................................. 44

Zhiming Li, Juan Liu, Lingfu Xie, Xijun Wang, Ming Jin
Low-Cost Traffic Perception for Road Detector Data Estimation: A Deep Learning Approach ........................................ 50
  Caoyi Zha, Jianzhe Xue, Qinghong Shen, Haibo Zho

ZSFA: Zero-Shot Fingerprint Augmentation for WiFi Fingerprint Based Indoor Localization ........................................ 55
  Tian Lan, Yuanqing Ye, Sihai Zhang

Intelligent Reflective Surface-Assisted MEC Securely Calculates Offloading Policy ................................................. 60
  Lei Wang, Jie Wang, Xue Jiang, Jingwu Cui, Baoyu Zheng

◆ Computer Vision and Image Processing Symposium

A Lightweight Network with Lane Feature Enhancement for Multilane Drivable Area Detection ................................ 66
  Lin Sun, Fei Yan, Tao Deng, Chenran Jiang, Jun Li

Hybrid Attention Fusion Segmentation Network for Diffuse Large B-cell Lymphoma in PET-CT ............................. 72
  Shun Chen, Ang Li, Jianxin Chen, Xuguang Zhang, Chong Jiang, Jingyan Xu

Large Kernel Attention Hashing for Efficient Image Retrieval......................................................................................... 77
  Xinxin Zhao, Zhuang Miao, Yufei Wang, Jiabao Wang, Yang Li

Machine Learning-based Multi-classification for First-Episode Schizophrenics, Ultra-high risk Schizophrenics, and Healthy Controls ........................................................................................................ 84
  Wenmei Li, Nuoya Yu, Wei Yan, Rongrong Zhang

UM-Net: An MLP-based Image Segmentation Network .............................................................................................. 89
  Xinwei Liu, Li Huang, Jian Xiao

Underwater Image Restoration Based on An Improved Underwater Image Formation Model ..................................... 95
  Xin Nan Fan, Xuan Zhou, Peng Fei Shi, Huan Ru Sun, Shu Yue Ye

Efficient Shared Feature Learning for Cross-modality Person Re-identification ...................................................... 100
  Wanru Song, Xinyi Wang, Feng Liu

TSANet: Two-subnet Attention Network for Single Image Dehazing ........................................................................ 106
  Chenran Jiang, Fei Yan, Tao Deng, Lin Sun, Jun Li

Fast and Accurate Detection of UAV Objects Based on Mobile-Yolo Network ......................................................... 112
  Jun Wang, Wang Hongjun, Jian Liu, Rui Zhou, Chunhao Chen, Chuang Liu

Building Scale-Attentive Visual Transformers for Intelligent Electric Power System Inspection ........................... 117
  Mei Wu, Hongxing Wang, Hainan Wang, Yue Meng, Weiping Mao

A UAV Target Detection Algorithm Based on YOLOv4-Tiny and Improved WBF ..................................................... 122
  Qianqing Cheng, Hongjun Wang, Xicheng Ding, Xianghua Du
Attributes and Semantic Constrained GAN for Face Sketch-Photo Synthesis ................................................................. 127
   Jieying Zheng, Haoxian Li, Feng Liu
STSANet: Retinal Vessel Segmentation via Spatial-Temporal and Self-Attention Encoding ..................................................... 132
   Yi Huang, Tao Deng
Multi-scale/attention Convolutional Network for Diffuse Large B Lymphoma Segmentation in PET Image .................. 138
   Wei Zhai, Jianxin Chen, Daiyong Min, Ang Li, Chong Jiang, Jingyan Xu
A Robust Vehicle Detection Model Based on Attention and Multi-scale Feature Fusion .................................................. 143
   Yuxin Zhu, Wenbo Liu, Fei Yan, Jun Li
Defect Reconstruction for Class-imbalanced Power System Defect Recognition ............................................................. 149
   Hongxing Wang, Mei Wu, Yu Song, Xin Zhang, Weiping Mao

◆ Edge Computing and Intelligence Symposium

Bi-directional Deep Transfer Learning for RIS-enhanced Multi-cell OFDMA Systems ...................................................... 154
   Gaoxiang Sun, Xiaoming Wang, Rui Jiang, Ting Liu, Youyun Xu
Multi-Slot Dynamic Computing Resource Optimization in Edge Computing ................................................................. 160
   Pengyu Chen, Han Xu, Xingwang Fan, Jing Hu, Tiecheng Song
Federated Multi-Agent Reinforcement Learning for Collaborative Edge Caching in Content Delivery Networks ............ 166
   Jialing Chang, Naifu Zhang, Meixia Tao, Hu Tuo
Asynchronous Federated Learning Based Mobility-aware Caching in Vehicular Edge Computing .................................. 171
   Wenhua Wang, Yu Zhao, Qiong Wu, Qiang Fan, Cui Zhang, Zhengquan Li
DDQN Based Handover Scheme in Heterogeneous Network ............................................................................................ 176
   Cuan Zhang, Xuie Li, Chunyan Liu
Age of Information Analysis of NOMA-MEC Offloading with Dynamic Task Arrivals .................................................... 181
   Lei Liu, Jingzhou Qiang, Yanting Wang, Fan Jiang
Quality-Aware User Scheduling for Federated Mobile Crowdsensing .................................................................................. 187
   Hui Zhang, Ning Ti, Wenchao Xia, Yiyang Ni, Qin Wang, Haitao Zhao, Hongbo Zhu
Malicious Models-based Federated Learning in Fog Computing Networks ................................................................. 192
   Xiaoge Huang, Yang Ren, Yong He, Qianbin Chen
Estimating Age of Information Using Finite Order Moments ...................................................................................... 197
   Licheng Chen, Yunquan Dong
Joint Optimization of Energy Consumption and Latency Based on DRL: An Edge Server Activation and Task Scheduling Scheme in IIoT ................................................................. 203

Rui Ma, Xiaotian Zhou, Haixia Zhang, Dongfeng Yuan

EEG Artifact Removal Based on Independent Component Analysis and Outlier Detection ..................... 209

Xinxin Wang, Xiuwei Wang, Biao Zhou

Learning-driven Cost-Efficient Multi-access Mobile Edge Computing via NOMA-SWIPT Transmission .... 215

Chenglong Dou, Ning Huang, Yuan Wu, Liping Qian, Bin Lin, Zhiguo Shi

Federated Spatio-Temporal Traffic Flow Prediction Based on Graph Convolutional Network .................... 221

Hanqiu Wang, Rongqing Zhang, Xiang Chengy, Liuqing Yang

Design of Delay-Optimal Robust Edge Computing in 6G Wireless Networks ........................................ 226

Qi Wang, Xiaoming Chen, Qiao Qi

Optimal Power Control for Over-The-Air Federated Edge Learning Using Statistical Channel Knowledge ..... 232

Xichen Yu, Bingnan Xiao, Wei Ni, Xin Wang

◆ Emerging Areas in Communications Symposium

Dynamic Distributed-Layered Semi-Grant-Free NOMA Scheme for Uplink Transmissions ..................... 238

Rui Luo, Liang Wu, Zaichen Zhang, Jian Dang, Bin Wu, He Wang

5G Virtual Private Network Planning Methodology Analysis ........................................................................ 243

Tangbai Cheng, Fang Zhou

CNN-BiLSTM-based Learnable Viterbi Signal Detection without Channel State Information ....................... 247

Yuanyuan Lan, Xiaoming Wang, Dapeng Li, Ting Liu, Youyun Xu

A New Approach to Dealing with the PAPR Problem for OFDM Systems via Deep Learning .................... 252

Xinyi Tang, Zhiqiang Tan, Limin Xiao, Ming Zhao, Yunzhou Li

Design and Optimization on Covert Communication-Oriented Short Packet D2D ........................................ 257

Xiaolong Zhang, Jie Liu, Liyu Zhi

Beamforming Optimization for Full-Duplex NOMA Enabled Integrated Sensing and Communication ........ 264

Kai Chen, Ruoguang Li, Li Wang, Lianming Xu, Aiguo Fei

Statistical CSI-based Beamforming Design for Massive MIMO-enabled URLLC Networks ...................... 269

Ruizhe Wang, Hong Ren, Cunhua Pan, Nan Liu

IRS-Assisted UAV Covert Communication via Location and Power Optimization ........................................ 275

Chao Wang, Xinying Chen, Jianping An, Zehui Xiong, Chengwen Xing, Nan Zhao, Dusit Niyato
Smart Handover Scheme for a 5G-Enabled Ambulance
Yao Zhao, Xianchao Zhang

Multi-connection BP Decoding for Polar Codes
Liuchang Yang, Dianhong Wang, Zhongxiu Feng, Yangyang Liu, Lixia Xiao

Multi-Access Edge Computing using Mode Division Multiple Access
Lei Wang, Haizhou Wang, Xue Jiang, Jingwu Cui, Baoyu Zheng

A Lightweight Broad Learning System for Wireless Traffic Prediction
Xinyu Li, Yajun Chen, Mengwen Diao, Hengfa Liu, Xiao Liu, Xin Wei

Unsupervised Learning-Based Joint Precoding and Phase Shift Design for RIS-Assisted mmWave Communication Systems
Yang Jiao, Yu Han, Xiao Li, Shi Jin

Probabilistic Jamming Aided Covert Communication in the Finite Blocklength Regime
Ruiqian Ma, Weiwei Yang, Kaixin Cheng, Xingbo Lu

Channel Charting-Based Pilot Assignment over Spatially Correlated Channels
Yamei Xu, Ming Zhao, Sihai Zhang, Gaoning He

Slice Freshness Guaranteed Resource Allocation in Vehicular Networks
Yaping Cui, Xisheng Yang, Peng He, Ruyan Wang, Dapeng Wu

Automatic Modulation Recognition Based on Multi-Channel Neural Network Model
Xianchao Zhang, Shengyu Ma, Jian Shi, Panpan Li, Guangxue Yue

An Edge Based Framework for Risk Assessment of Communicable Disease
Ruochen Huang, Yong Li, Wei Feng, Xin Zhang, Tao Shan, Yun Liu

Characterizing the Energy-Efficiency Region of Symbiotic Radio Communications
Sihan Wang, Jingran Xu, Yong Zeng

TAN: Temporal Attention Enhanced Network for Cellular Traffic Prediction
Huaiyu Wu, Junyuan Wang, Chang Liu

Tactile Signal Reconstruction Assisted by Video Processing
Mingkai Chen, Yu Xie

Deep Reinforcement Learning for the Capacitated Vehicle Routing Problem with Soft Time Window
Wang Xiaohe, Shi Xinli
Information Theory and Coding Symposium

Upper Bounds on the Capacity of Multiple-Antenna Optical Intensity Channels: A Sphere-Packing Perspective

Su Fang Yang, Longguang Li, Jintao Wang

Learning Based Joint Coding-Modulation for Digital Semantic Communication Systems

Yu Fei Bo, Yiheng Duan, Shuo Shao, Meixia Tao

Coded Distributed Graph-Based Semi-Supervised Learning

Ying Du, Siqi Tany, Kaifeng Han, Jiamo Jiang, Zhiqin Wang, Li Chen

A Demo of Semantic Communication: Rosefinch

Hao Dong, Weijie Yue, Kai Niu

Block Markov Superposition Transmission of Fourier Transform Pair Codes

Xiao Ma, Dian Chen, Yaping Lv

All Integral Points Satisfying Linear Rank Inequalities on Four or Less Variables are Representable

Jia Hong Wu, Nan Liu, Wei Kang

Concatenation of SC-LDGM Codes with Outer BCH Codes

Yi Xin Wang, Xiao Ma

ORB-Enhanced Belief Propagation Decoding of Polar Codes

Xin Tao Jin, Zhen Yuan Chen, Yuejun Wei, Wenyi Zhang, Huarui Yin, Liping Li

End-to-end Delay Analysis for Coded Computing with Multi-Task Arrival

Zhongming Ji, Li Chen, Xiaohui Chen, Guo Wei

Optimality of Polar Codes in Additive Steganography under Constant Distortion Profile

Qi Yi Yao, Weiming Zhang, Nenghai Yu

Improved Decoder by Partially Permuted Factor Graphs of Polar Codes

Hongji Cui, Kai Niu, Junwei Ren

On Scalable Source Coding Problem with Side Information Privacy

Jian Lu, Yinfei Xu, Zhenchao Zhu

Integrated Sensing, Communication, and Computing Symposium

Waveform Design for MIMO-OFDM Based Dual-functional Radar and Communication Systems

Tianchen Liu, Liang Wu, Zaichen Zhang, Jian Dang, Bingcheng Zhu, Yin Yao, Liu Dongsheng
On Performance Evaluation of OTFS and OFDM Modulations for Sensing ................................................................. 427
Bowen Wang, Nanxi Li, Zheng Jiang, Jianchi Zhu, Xiaoming She, Peng Chen

Exploiting Cell-Free Massive MIMO for Computational Imaging .............................................................. 432
Mili Li, Xiaoming Chen

Joint Transmit Waveform and Passive Beamforming Design for RIS-aided MIMO DFRC System .................. 438
Biao Sun, Longyao Ran, Shengyao Chen, Feng Xi

Construction of Wideband Radio Environment Map Based on Compressed Sensing ..................................... 444
Ensong Yang, Hui Yu, Xiaohao Mo, Ao Gao

Fusion of 5G Carrier Phase Ranging and 5G CSI Fingerprinting for Indoor Positioning ........................................ 450
Xiaobo Li, Liang Chen, Xin Zhou, Yanlin Ruan, Zhaoliang Liu

An Intelligent Indoor Localization System in the NLOS Environment Based on Deep Learning and CSI Images ........................................................................................................................................................................................................................................... 455
Lu Sun, Liang Wu, Zaichen Zhang, Jian Dang, Yulong Shen, Gefeng Huang, Liliang Ding

Energy Efficiency Maximization in an IRS-Assisted Dual-Functional Radar and Communication System........... 460
Zhenhao Yu, Fuhui Zhou, Weizhi Zhong, Yuhang Wu, Qihui Wu

Position and Orientation Independent Wireless Gesture Recognition ........................................................... 466
Yihui Wang, Yafei Tian, Rui Peng

Adaptive Waveform Optimization for MIMO Integrated Sensing and Communication Systems Based on Mutual Information ............................................................................................................................................................................................... 472
Chunwei Meng, Zhiqing Wei, Zhiyong Feng

Pilot-Based Delay and Doppler Estimation in 6G Integrated Communication and Sensing Networks .............. 478
Xiaozhou Zhang, Jing Jin, Liang Ma, Yajuan Wang, Mengting Lou, Tao Jiang, Qixing Wang, Guangyi Liu, Jiangzhou Wang

◆ Intelligent Signal Processing Symposium

Specific Radar Emitter Identification Using 1D-CBAM-ResNet ........................................................................ 483
Jifei Pan, Linqing Guo, Qiuju Chen, Shengli Zhang, Jingwei Xiong

Exploiting Spectral Resource Allocation Scheme for TDOA-Based Multiple Source Localization .................... 489
Lanlan Huang, Yue Zhao, Zan Li, Chao Wang, Benjian Hao

Wideband Sparse Cascaded Channel Estimation for RIS-Assisted Wireless Systems ...................................... 495
Xiaohao Mo, Lin Gui, Xichao Sang, Xiaqing Diao
An Accurate Earthquake Localization Algorithm Using the TDOA Measurements between P and S Waves... 501
  Liehu Wu, Jingna Fan, Yanbin Zou

Semantics-Guided Contrastive Joint Source-Channel Coding for Image Transmission................................. 505
  Wenhui Hua, Dezhao Chen, Junli Fang, Lingyu Chen, João F. C. Mota, Xuemin Hong

FPGA-Based Implementation of Discrete Fractional Fourier Transform Algorithm........................................... 511
  Ruoyu Wang, Peng Chen, Dan Wang

Forecasting Stock Indexes with Metabolic DWT and MWA-GM(1,1)................................................................. 516
  Ziyang Jiang, Siyuan Lu, Jun Lin, Zhongfeng Wang

Deep Reinforcement Learning Based Resource Allocation for URLLC User-Centric Network.......................... 522
  Fajin Hu, Junhui Zhao, Jieyu Liao, Huan Zhang

Lightweight Neural Networks for Automatic Classification of ECG Signals................................................... 527
  Fan Jiang, Yuxin Li, Changyin Sun, Chaowei Wang

Feasibility Analysis and Target Detection Technology of Passive Radar Based on 5G Signal............................ 533
  Congcong Liu, Junhui Zhao, Huan Zhang, Qiuping Li

Design and Analysis of Amplitude-Phase-Form Detection in Residual Phase Noise...................................... 538
  Qian Wang, Wenqiang Ma, Li Ping Qian, Yuan Wu, Pooyi-yuen Kam

AoI-Aware Spectrum and Power Allocation for High-Speed Railway Networks.............................................. 544
  Difei Jia, Fengye Hu, Zhuang Ling, Zhi Mao, Zheng Chang, Timo Hämäläinen

A Novel Channel Identification Architecture for mmWave Systems Based on Eigen Features.......................... 550
  Yibin Zhang, Jinlong Sun, Guan Gui, Haris Gacanin, Fumiyuki Adachi

MADDPG-Based Power Allocation Algorithm for Network-Assisted Full-Duplex Cell-Free MmWave Massive
  MIMO Systems with DAC Quantization ........................................................................................................... 556
  Qingrui Fan, Yu Zhang, Zhaoye Wang, Jiamin Li, Pengcheng Zhu, Dongming Wang

A Model-Driven Network Based on ISTA for Massive MIMO Signal Detection.............................................. 562
  Hanying Zheng, Yiqing Zhang, Zhengyang Hu, Rongchao Sun, Jiang Xue

Optical Wireless Communications Symposium

A Novel Beam Adjustment Method Based on Galvo Scanner for Optical Wireless Communication.................... 568
  Wenhan Li, Zaichen Zhang, Shengjian Chen, Fei Yun

Indoor Visible Light Positioning Based on Extreme Learning Machine with Local Training Samples................ 573
  Ren Liu, Zhonghua Liang, Zhenyu Wang, Mengan Song, Wei Li
Signal Processing in Twin-field Quantum Key Distribution

Shuang Wang, Zhen-Qiang Yin, De-Yong He, Wei Chen, Guang-Can Guo, Zheng-Fu Han

A Novel Security Underwater Visible Light Communication System based on Phase Scrambling by Utilizing a Chaos Map

Zhilan Lu, Wenqing Niu, Nan Chi

◆ Internet of Things Symposium

A Traffic Scheduling Algorithm Combined with Ingress Shaping in TSN

Wenxuan Han, Yanjue Li, Changchuan Yin

Active User Detection for Uplink NOMA Communication: Deep Learning Approach

Chuanhang Yu, Chenglin Li, Gang Wu

A QoS Sensitive Networking Scheme Based on BLE Audio

Guangyue He, Weiwei Xia, Yiming Zhao, Feng Yan, Lianfeng Shen, Yinong Zhang, Yingbin Gao

Multivariate Time-Series Anomaly Detection in IoT Using Attention-Based Gated Recurrent Unit

Yifeng Tan, Guobing Li, Yuxuan Chen, Guomei Zhang

Resource Allocation of E2E Slices in Softwarized UAVs-Assisted 6G Terrestrial Networks

Haotong Cao, Xiaoming Wang, Rui Jiang, Ting Liu, Lei Xue, Daniel Xiapu Luo

Object Detection Model Based on Dual Visual Pathway

Ruixuan Chen, Xiao Yao, Yifeng Zeng

Finding the Truth from Uncertain Time Series Based on Entropy

Bo Jiang, Jizhou Sun

Direction of Arrival Estimation Based on Simplified Dictionary Matching Pursuit Algorithm with Rotational Invariance

Yiming Zhao, Weiwei Xia, Guangyue He, Feng Yan, Lianfeng Shen, Yinong Zhang, Yingbin Gao

Application of Transformer with Auto-Encoder in Motor Imagery EEG Signals

Rui Jiang, Liuting Sun, Xiaoming Wang, Youyun Xu

Deep Learning Based Localization Scheme for UAV Aided Wireless Sensor Networks

Hanjun Zhang, Feng Yan, Hao Li, Kai Ding, Tao Wu, Weiwei Xia, Lianfeng Shen

A Measurement Campaign of Industrial Environment for Ultra Reliable IIoT Systems

Qiwei Zhang, Tian Hong Loh, Dong Zhou, Fei Shen, Zhipei Huang, Fei Qin
Joint Resource Allocation and Location Optimization for UAV-Assisted IoT Wireless Networks in the 6G Era ........................................................................................................................................................................................................................................... 649

Chenyu Zhang, Haibo Dai, Baoyun Wang, Chunguo Li

Joint Edge Computing and Caching Based on D3QN for Lunar Internet of Things....................................................... 655

Geng Chen, Jingli Sun, Fei Shen, Qingtian Zeng

Task Scheduling via Modified Deep Reinforcement Learning for MEC-Enabled Industrial IoT.............................. 661

Yizhou Wang, Haixia Zhang, Xiaotian Zhou, Dongyang Li, Dongfeng Yuan

Distributed Radar Interval Distance Estimation Based On Deep Neural Network ......................................................... 667

Xiayu Li, Peng Chen

◆ Large Scale Distributed Signal Processing Symposium

Resource Allocation for V2X Assisted Automotive Radar System based on Reinforcement Learning............ 672

Yuxin Fan, Jingxuan Huang, Xinyi Wang, Zesong Fei

A Novel High Capacity Transmission Frame Structure in Directional-Beam-Based Networks with Large Propagation Delays ........................................................................................................................................................................................................................................... 677

Jie Huang, Jing Zhang, Ming Zhao, Jiahao He, Sihai Zhang

Research on Transmission Performance of Wireless Communication System in V2X......................................................... 683

Cao Zhiwe, Zhang Kai, Han Hongji, Zhang Jinbao, Jia Jia

On the Performance of Non-Orthogonal Transmission Enabled Two-Tier CoMP Networks..................................... 689

Xianling Wang, Haijun Zhang, Hongwen Yang, Chen Zhu, Yue Tian

Deep Reinforcement Learning for the Joint AoI and Throughput Optimization of the Random Access System ........................................................................................................................................................................................................................................... 695

Hanyu Zhao, Hanxiao Yu, Zhongpei Zhang, Ming Zeng, Zesong Fei

Spatial-Temporal Context-Aware Location Prediction Based on Bidirectional Self-Attention Network........... 701

Kujie Lin, Junxin Chen, Xiaojian Lian, Weimin Mai, Zhiheng Guo, Xiang Chen, Terng-Yin Hsu

Maximum Likelihood DOA Estimation Aided by Magnitude Measurements............................................................... 707

Ningbo Liang, Shengchu Wang

Dynamic Beam Hopping of Double LEO Multi-beam Satellite based on Determinant Point Process ............... 713

Weibiao Li, Ming Zeng, Xinyao Wang, Zesong Fei

Adaptive mmWave Beam Tracking in 3D Scenes via Multi-Agent Deep Q Learning......................................................... 719

Yuncheng Lu, Fan Meng, Yongming Huang, Zhaohua Lu, Fei Yu
Robust Low-Rank Matrix Factorization via Block Iteratively Reweighted Least-Squares.................................................. 725
  Nanxi Li, Zhen-Qing He, Jianchi Zhu, Xiaoming She, Peng Chen, Ying-Chang Liang

◆ Mobile and Computing Networks Symposium

Deep-Reinforcement-Learning-Based Doppler Compensation for High-Mobility Cell-Free Massive MIMO Systems........................................................................................................................................................................ 731
  Xizhao Zhang, Jie Ling, Yaqi Li, Jiamin Li, Pengcheng Zhu, Dongming Wang

The Transmission Scheme for UAV MIMO System Based on Reinforcement Learning................................................. 736
  Wenyi Zhang, Chen Liu, Ge Wang, Yunchao Song

A Formation Control Algorithm for Air-Ground Cooperative UAV............................................................................................ 741
  Mengyuan Chen, Bo Li, Jinglong Wang, Gang Wang

A Suggest-And-Improve RAN Slicing Strategy for Mobile Networks............................................................................................. 748
  Chengdong Yang, Tianyu Wang, Zhe Xiaoy, Shaowei Wang

Service-Oriented Topology Reconfiguration of UAV Networks with Deep Reinforcement Learning............................... 753
  Ziyan Chen, Nan Cheng, Zhisheng Yin, Jingchao He, Ning Lu

Coverage Analysis of Cell-Edge Users in Reconfigurable Intelligent Surface-Assisted Cellular Networks............. 759
  Hanwen Chen, Howard H. Yang, Qin Tao, Caijun Zhong

Joint Precoding and Jamming Design for Secure Transmission in NOMA-ISAC Networks ........................................ 764
  Dongdong Li, Zhutian Yang, Nan Zhao, Zhilu Wu, Yonghui Li, Dusit Niyato

On the Uplink Performance of Multi-User MC-CDMA Satellite-Terrestrial Deliveries.................................................. 770
  Yi Zhang, Weihao Yan, Tian Yuan, Ping Yan, Jinpeng Song, Xiangyuan Bu

Task Delay Minimization in Multi-UAV-Assisted Mobile Edge Computing System................................................................. 776
  Ye Wu, Feng Tian, Yinqiu Jiang, Xin Wei

Computation-Intensive Status Update in UAV Relay-Assisted IoT with Short Packet Communications................. 782
  Xianbang Diao, Yueming Cai

Effective Computational Efficiency Maximization in Cooperative NOMA Based MEC System............................. 788
  Lei Wang, Xin Liu, Xue Jiang, Jingwu Cui, Baoyu Zheng

An Effective Capacity Empowered Resource Allocation Approach in Low-Latency C-V2X........................................... 794
  Yicheng Xie, Kai Yu, Zhixuan Tang, Luofang Jiao, Jianzhe Xue, Haibo Zhou
◆ Quantum Signal Processing Symposium

Optimized meta-VQE Algorithm for Better Trend Learning of Ground State Energy ................................................................. 800

Han Zeng, Ze-Tong Li, Tian Luan, Yulong Fu, Xu-Tao Yu, Zai-Chen Zhang

A Delegated Quantum Approximate Optimization Algorithm ........................................................................................................... 804

Yuxun Wang, Junyu Quan, Qin Li

Channel Modeling Based on Quantum Generative Adversarial Network .......................................................................................... 809

Zhairui Gong, Xinling He, Zhifan Wan, Zetong Li, Xianchao Zhang, Xutao Yu

Quantum Computation Using Coherent Ising Machines Based on Spiking Neural Networks .................................................. 813

Bo Lu, Kai Wen, Chuan Wang

Measurement-Device-Independent Three-party Quantum Secure Direct Communication Based on Entanglement Swapping ................................................................................................................................. 818

Jian-Hong Shi, Lan Zhou, Wei Zhong, Yu-Bo Sheng

Simple Quantum Communication Protocol Based on Bell Test ........................................................................................................ 826

Yiyou Fan, Zaichen Zhang

◆ Satellite Communications Symposium

Power Allocation for NOMA-Assisted Integrated Satellite-Aerial-Terrestrial Networks with Practical Constraints ........................................................................................................................................................................ 831

Haifeng Shuai, Kenfeng Guo, Kang An, Shibing Zhu, Rui Liu

Ergodic Capacity and Outage Probability Analysis of RIS-Aided Hybrid Satellite-Terrestrial Networks............... 837

Yin Ding, Yulong Zou, Bin Li

Dynamic Beam Assignment-based Secure Beamforming Scheme in Large-scale Multi-beam LEO Satellite Constellation ................................................................................................................................................................ 842

Xiaofen Jiao, Yichen Wang, Haotian Liu, Tao Wang

One-Step Grant-Free Random Access for Burst Short Packets in Satellite-Terrestrial Integrated Network ...... 848

Xu Han, Xuefei Zhang, Jin Xu, Xiaofeng Tao


Shuyuan Lu, Guanjun Xu, Lin Qu, Qinyu Zhang, Zhaohui Song
Game Theoretic Traffic Scheduling and Hybrid QoS-Aware Routing in Software Defined Satellite Networks


Multi-Dimensional Resource Optimal Allocation Scheme for Tiansuan Constellation

Chao Wang, Qing Li, Qibo Sun, Shangguang Wang

Energy-Efficient Coded Content Placement for Satellite-Terrestrial Cooperative Caching Network

Zihan Chen, Shushi Gu, Qinyu Zhang, Ning Zhang, Wei Xiang

TCP Performance in Satellite Backhauling for Maritime Communications: A ns-3 Study

Sibo Pan, Ruifeng Gao, Yingdong Hu, Ye Li

Multidimensional Direct Fractional Programming based Multicast Beamforming Design in Space-Ground Integration Networks

Huiqian Qiu, Hongming Zhang, Mugen Peng

FedHAP: Fast Federated Learning for LEO Constellations using Collaborative HAPs

Mohamed Elmahallawy, Tie Luo

Unmanned Aerial Vehicle Communications Symposium

Joint Sensor Localization and Data Collection in UAV-Assisted Wireless Sensor Network

Mingyue Zhu, Wenyan Xu, Ningyan Guo, Zhiqing Wei

Performance Analysis of Dual-Hop UAV-Assisted FSO Communication System with DF Protocol

Jialin Wang, Guanjun Xu, Zhongyuan Zhao, Maozhe Xu, Xiaozong Yu, Qinyu Zhang

Lifetime Maximization for UAV-Enabled Integrated Localization and Communication Networks in Emergency Scenarios

Xinyu Yu, Zhenyu Liu, Lianming Xu, Li Wang

Mean-Field Multi-Agent Reinforcement Learning for Adaptive Anti-Jamming Channel Selection in UAV Communications

Feng Du, Jun Li, Yan Lin, Zhe Wang, Yuwen Qian

Aerial Reconfigurable Intelligent Surface Assisted Maritime Wireless Communications

Hongming Zhang, Lajos Hanzo

Environment-aware Path Planning for UAV-assisted Search and Rescue

Jianhui Chen, Shiqi Zeng, Xiaoli Xu

An Extended Family of No-Hit-Zone Frequency Hopping Sequences for UAVs Cluster Communication

Wendong Gao, Lei Guan, Zan Li, Jiangbo Si, Pei Hui, Hang Fu
Deep Reinforcement Learning Assisted UAV Trajectory and Resource Optimization for NOMA Networks... 933
   Peixin Chen, Jian Zhao, Furao Shen

Multi-Objective Utility Optimization-Based Cooperative Mission Planning for UAVs................................. 939
   Xuan Li, Rong Chai, Rouzhi Tang

◆ Wireless Transmission Technology and Networking Symposium

RIS-Aided Robust Secure Beamforming Design Against Pilot Spoofing Attack....................................................... 944
   Linyun Chai, Tong Bai, Lin Bai

MIMO Secure Communication with Reconfigurable Intelligent Surface: Finite-Alphabet Inputs ......................... 950
   Yingjie Wu, Shilian Wang, Junshan Luo, Weiyu Chen

A Deterministic Communication Technique in the 5G-Adv/6G Access Network Systems ....................................... 955
   Lei Kong, Pin Wu, Jun Chu, Wei Xu, Lei Zhou

Phase Noise Estimation in Time Domain for OFDM System.......................................................................................... 961
   Heng Du, Jiang Xue, Qihong Duan

Progressive Linear Precoder Optimization for Multicast Retransmission................................................................. 967
   Jian Xiong, Zhe Zhang, Meixia Tao

Average Spectral Efficiency for TDD-based non-Stationary XL-MIMO with VR Estimation............................... 973
   Jingjing Zhang, Jun Zhang, Yu Han, Jue Wang, Shi Jin

Angular Domain Channel Estimation for Symmetrical Nonuniform Linear Array in Communication Systems
.................................................................................................................................................................................................................................................. 978
   Qidi Li, Yanyan Wang, Li Li, Xiaohu Tang, Xike Ren

Gaussian Approximation Based Low Complexity Soft Demapper for Spatial Modulation Aided MIMO-LDM
.................................................................................................................................................................................................................................................. 984
   Shunlei Zhang, Jian Song

Single Threshold Packet Scheduling Policy for AoI Minimization in Resource-Constrained Network................. 990
   Yonghao Ji, Xiaoli Xu

Active Reconfigurable Intelligent Surface (RIS) Aided Secure Wireless Transmission Under a Shared Power
Source Between Transmitter and RIS.................................................................................................................................................................................. 996
   Limeng Dong, Wanyu Yan

SNR Analysis for RIS-Aided Communication System in Near- and Far-Fields.......................................................... 1001
   Qiping Yang, Ruisi He, Bo Ai
Hybrid Beamforming Design with Finite Resolution Phase Shifters in Multi-User Systems ...............................................1007
Liyan Wen, Hua Qian, Xiliang Luo, Kai Kang

Information Geometry Approach for Massive MIMO Channel Estimation .................................................................1012
Jiyuan Yang, An-An Lu, Yan Chen, Xiqi Gao, Xiang-Gen Xia, Dirk Slock

CNN-Based Auto Fully-Digital Compensation Method for User Equipment with IQ Imbalance ..........................1018
Wenbin Dong, Huarui Yin, Li Chen

Semi-Supervised Learning for MIMO Detection ...........................................................................................................1023
Peiyan Ao, Runhua Li, Rongchao Sun, Jiang Xue

Physical Layer Authentication Based on DOA and Rotational State .................................................................1028
Weiyang Xu, Lingling Tao, Qinglin Xu

Pilot-Assisted Time-Varying Channel Estimation for Universal Filtered Multicarrier Modulation .......................1034
Fuping Si, Jianping Zheng, Changjiu Chen

Exploiting Markov Random Field Sparsity for Wideband Channel Estimation in Massive MIMO Systems ..........1040
Xiaofeng Liu, Wenjin Wang, Xinxin Gong, Xiao Fu, Xiqi Gao, Xiang-Gen Xia

Secure Transmission of IRS-assisted A2G Multiuser Communication System with Hardware Impairments ......1046
Tianhao Cheng, Buhong Wang, Kunrui Cao, Runze Dong, Danyu Diao

Signal Detection for HF Skywave Massive MIMO-OFDM with Slepian Transform ..............................................1052
Linfeng Song, Ding Shi, Lu Gan, Xiqi Gao

A Novel Transmission Strategy for Hybrid RIS Aided Millimeter Wave OTFS Systems ...........................................1058
Muye Li, Shun Zhang, Yao Ge, Feifei Gao, Pingzhi Fan

Multi-floor Indoor Location Method Based on Fusion-CNN ......................................................................................1064
Yepeng Xu, Yuanpeng Zhao, Yan Yang, Dengyin Zhang

Packet Loss and Delay Analysis for a Wireless Fading Channel Using Stochastic Network Calculus ....................1070
Pengxiang Li, Yao Wei, Nanxi Li, Tao Huang, Ning Jin

Learning to Beamform in Multi-Group Multicast with Imperfect CSI ..............................................................1075
Zhe Zhang, Meixia Tao, Ya-Feng Liu

Multi-Source Fusion Localization Technology Based on Convolutional Neural Networks ...................................1081
Zengshan Tian, Zhuangyin Xiao, Yudong Huang
Computation-Dependent Routing Based Low-Latency Decentralized Collaborative Computing Strategy for Satellite-Terrestrial Integrated Network

Buyun Ma, Zhiyuan Ren, Wei Guo, Wenchi Cheng, Hailin Zhang

Hybrid Spectrum Access for V2V Heterogeneous Networks with Deep Reinforcement Learning

Jingfei Huang, Jingyi Peng, Honglin Xiang, Lingjie Li, Yang Yang

A New Low-Complexity WMMSE Algorithm for Downlink Massive MIMO Systems

Ningxin Zhou, Zheng Wang, Lanxin He, Yang Huang

Rapid On-Off-Division Duplex Based on Successive Interference Cancellation

Chani Kong, Hancheng Lu, Fengqian Guo, Qiaojia Lu, Xinyu Yang

Resource Management and Computing Offloading to Minimize Power Consumption Cost in Slice-MEC System

Lei Wang, Xinjie Yao, Xue Jiang, Jingwu Cui, Baoyu Zheng

A Cost-sensitive SVM Based Approach for Root Cause Diagnosis in Wireless Networks

Wang Qi, Pan Zhiwen, Liu Nan, You Xiaohu

Simultaneous Information Relaying and Jamming via IRS to Secure NOMA Networks

Mengyi Ji, Jian Chen, Lu Lv, Qingqing Wu, Zhiguo Ding, Long Yang

A Novel 3D Geometry-Based Channel Model for Massive MIMO V2V Communication in Curved Tunnel Environments

Maotao Li, Nan Ma, JianQiao Chen, Yamao Zhao

DRL-based Joint Beamforming Design for RIS-assisted mmWave MU-MISO system

Ken Long, Jinsong Lin, Guifang Zhao, Yunhong Zhou, Yangzhou Mei

Active Reconfigurable Intelligent Surface Aided Communication with Partial CSI

Gui Zhou, Cunhua Pan, Hong Ren

Energy Efficiency Maximization via Joint Beamforming and Power Control for URLLC Service in Network-Assisted Full Duplex Systems

Yuting Yin, Bo Liu, Pengcheng Zhu, Jiamin Li, Yan Wang

Dual Quadrature Phase Reflection Modulation for RIS-Assisted Integrated Sensing and Communication

Mei Gao, Wenchi Cheng, Wei Zhang, Wei Xie

Optimized Uplink Transmission for C-RAN with Hybrid Analog-digital Beamforming and Resolution-adaptive ADCs

Min Hua, Fei Gao, Xinlai Luo, Wenging Li, Zhiyong Chen, Bin Xia
IRS-Aided Secure Communications over an Untrusted AF Relay System ................................................................. 1161
Ying Gao, Deli Qiao, Haifeng Qian

MixerNet: Deep Learning for Eigenvector-Based CSI Feedback .................................................................................. 1167
Hongrui Shen, Long Zhao, Fei Wang, Yuhua Cao

Energy-Efficient Optimization for Multi-cell Distributed Massive MIMO URLLC Systems ............................................ 1172
Xiaoyue Zhu, Bo Liu, Pengcheng Zhu, Jiamin Li, Yan Wang

Deep Reinforcement Learning Based Resource Allocation for Intelligent Reflecting Surface Assisted Dynamic
Spectrum Sharing ................................................................................................................................................................................................. 1178
Jianxin Guo, Zhe Wang, Jun Li, Jie Zhang

Active Constraints Inspired Zero-Forcing Precoder Design under Per-Antenna Power Constraints .................. 1184
Xianzhi Hu, Xuchu Dai

Grant-Free NOMA over Universal Filtered Multicarrier ................................................................................................. 1189
Changju Chen, Jianping Zheng, Fuping Si

Personalized Wireless Resource Allocation in Multi-connectivity B5G C-V2X Networks .............................................. 1195
Ziyi Lu, Tianqi Zhang, Xiangjie Ji, Bo Qian, Luofang Jiao, Haibo Zhou

Performance of Multiple Intelligent Reflecting Surfaces Assisted Communication ....................................................... 1201
Donglin Jia, Yi Zhong, Robert C. Qiu, Xiaohu Ge

Author Index