

2025 13th International Conference on Communications and Broadband Networking (ICCBN 2025)

**Chengdu, China
27-29 November 2025**

IEEE Catalog Number: CFP251W0-POD
ISBN: 979-8-3315-7650-9



Copyright © 2025, IEEE

All Rights Reserved

Copyright and Reprint Permissions:

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

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

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

IEEE Catalog Number:	CFP251W0-POD
ISBN (Print-On-Demand):	979-8-3315-7650-9
ISBN (Online):	979-8-3315-7649-3

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA

Phone:	(845) 758-0400
Fax:	(845) 758-2633
E-mail:	curran@proceedings.com
Web:	www.proceedings.com

TABLE OF CONTENTS

Sensing-Enabled Predictive Beam Tracking for UAVs in Cell-Free mMIMO ISAC Networks	1
<i>Mingze Sun, Donggen Li, Shuaicheng Yan, Ruobing Li, Chong Huang, Wenjiang Feng</i>	
Design of Non-Gaussian Receivers for Ultra-Low Frequency Channels	6
<i>Wenwei Ying, Xun Li, Xiaobo Wang, Zijie Niu, Anbo Zhang, Zhen Qiao</i>	
Joint Passive Beamforming and Power Control for Full-Duplex Two-Way Wireless Systems Aided by Intelligent Reflecting Surface	11
<i>Xiangbai Liao, Jiagang Liu, Zhibin Pan</i>	
Analysis and Classification of Modulated Eye Diagram Signals Using Convolutional Neural Networks Model Toward an Intelligent Optical Communication System	20
<i>Yue Geng, Xuhui Liu, Chun-Zhang Chen, Liang Wang, Quan Pan, Hanming Wu</i>	
Analysis and Measurement of Indoor Orbital Angular Momentum Diffraction Propagation	24
<i>Shangling Li, Kai Wen, Xi Liao, Tao Hu</i>	
HDS-RIIA: Adaptive Hybrid Detection for Reliable Random Readout	29
<i>Qike Pang, Wenbo Liu, Zheng Ma</i>	
Achieving Secure and Reliable URLLC in Cell-Free Massive MIMO via Self-Supervised Learning	35
<i>Donggen Li, Shuo Sun, Xinxin Ma, Hengjie Ren, Chong Huang, Wenjiang Feng</i>	
An Intelligent Power Control Method for 5G-A Terminal-Network Converged MIMO Based on Fuzzy Logic	40
<i>Jingyao Wang, Di Wu, Haixiao Cao</i>	
A Dual-Branch Architecture for Multimodal Cyberattack Detection in Power Monitoring Systems	46
<i>Feng Sun, Shuai Ren, Tong Li, Jian Chen, Ruichao Xu, Jiaqi Lin</i>	
Yet Another Watermark for Large Language Models	51
<i>Siyuan Bao, Ying Shi, Zhiguang Yang, Hanzhou Wu, Xinpeng Zhang</i>	
Digital Forensic Gaps in Internet of Everything-Driven Cybercrime: A Review of Tools, Techniques, and Jurisdictional Challenges	56
<i>Loso Judijanto, Sri Nurhayati</i>	
A Negative Optimization Analysis of Gradient Similarity in Teva's Odmum Mechanism	61
<i>Jingkun Zhang, Wensheng Meng, Wenhan Ma, Zixuan Wang, Siyi Sun, Jianhong Zhang</i>	
EBIPFL: An Efficient Cloud-Edge Collaborative Federated Learning Approach that Supports Bidirectional Integrity Protection	65
<i>Cheng Qian, Li Lin, Kang Yang</i>	
Research on Access Control and Transaction Delivery of Cultural Resource Based on Smart Contract and Zero- Knowledge Proof	70
<i>Ye Yu, Siya Xu, Peng Yu, Shu Fu, Xu Chen, Dingshi Liao</i>	
PPDFP: Privacy-Preserving Data Filtering Protocol for Large-Scale ID Alignment of Vertical Federated Learning	75
<i>Zhengtao Jiang, Hanyu Zhou, Zhengyang Wu, Shujia Li, Yiyang Peng, Chenqing Cai</i>	

Analysis of Wireless Network Coverage Performance in Low Altitude Transmission Scenarios	82
<i>Haitao Chen, Youcheng Liang, Wenjun Su</i>	
Polar Communication Oriented Multimodal Complex-Valued LSTM-MIMO Channel Prediction	87
<i>Hui Xie, Huafeng Wu, Xiaojun Mei, Xia Liu</i>	
A MPLS VPN Network Model Based on SDN	93
<i>Jun Tao, LiPing Zhang, Lei Yue, Hao Xu</i>	
A Dual-Path EKF-SR Fusion Algorithm for LEO Satellite Doppler-Based Positioning	98
<i>Yunhan Wan, Jinghong Sun, Wenbin Guo</i>	
Pinching-Antenna Selection in Downlink Systems	103
<i>Jingjing Yong, Jing Zhao, Han Li</i>	
A Dynamic Semantic Selection Approach for 6G Semantic Communications	107
<i>Chunhua Zhu, Yanning Yang, Bohui Wang</i>	
A Geometric-Analytical Algorithm for Hybrid AOA/TDOA Localization	112
<i>Jindian Lv, Feifei Pang, Haiyan Wang, Yong Liang</i>	
Temporal Adaptive Attention Network for Video Denoising in Dynamic Scenes	117
<i>Renfang Shi, Xiang He, Quanxing Xiang</i>	
Multi-Agent Reinforcement Learning Empowered Heterogeneous Service Component Caching and Delivery for Metaverse	123
<i>Siya Xu, Boyang Zhang, Peng Yu, Shu Fu, Xu Chen, Dingshi Liao, Meng An</i>	
A Robust Adaptive Cost-Function-Based Subband Filtering Algorithm with Variable Matrix Step-Size Design	128
<i>Kexu Chen, Hongyu Han, Sheng Zhang</i>	
Exploration of Degrees of Freedom for X Channes by Discrete Quantum Firefly Algorithm	133
<i>Liang Wang, Feng Liu</i>	
AI-Powered Community Elderly Care: An Intelligent Companion System Integrating Emotional-Computing and Health Monitoring	138
<i>Juan Yang, Mei Li, Haoxue Zhou</i>	
Improved Reversible Data Hiding for JPEG Images with Double-Layer Embedding	143
<i>Chengmei Jin, Jingjing Yang, Chengyuxin Hu, Mengyao Xiao, Qi Chang, Haorui Wu, Xiaolong Liu</i>	
Research on Digital Recognition Method of Water and Electricity Meter Based on EDD Features and SVM	149
<i>Haoxue Zhou, Xiang He, Changhui Li, Rui Yang</i>	
MMS-DETR: Fusing State Space Model and Mixed Aggregation for Small Object Detection on USVs	154
<i>Jizhang Luo, Feng Liu</i>	
Dual-Prototype Few-Shot Change Detection in Remote Sensing: Multi-Scale Convolution and Transformer Integration	160
<i>Chengye Li, Xin Yan, Xia Zhang</i>	
Projection Learning and Comprehensive Low-Rank Tensor for Incomplete Multi-View Clustering	165
<i>Zicheng Zhao, Yunjie Zhang, Zhixin Yu</i>	

Deep Reinforcement Learning Assisted Task Offloading and Resource Allocation in Satellite Edge Computing	170
<i>Zhaodong Ding, Haixia Cui</i>	
Resource Allocation and Relay Selection in Decode-and-Forward Multiple-Relay Networks	175
<i>Jianhui Ma, Linsong Du, Chenxing Li</i>	
Joint Time-Space Resource Allocation for Multi-Beam Full-Airspace Phased Array System	181
<i>Linjie Yang, Yi Zhang, Tian Liu</i>	
QoS- Driven Wireless Resource Management for Network Slicing in Heterogeneous Cellular Networks	187
<i>Yongheng Wang, Jing Zhao, Zhiqi Ren, Rui Zhou, Kuan Shen</i>	
Energy-Efficient Resource Allocation for V2X Based on GNN and DRL	192
<i>Hanbin Zhao, Zhiwei Li, Zhaodong Ding, Peng Cao, Haixia Cui</i>	
Edge Server Deployment and Load Balancing Mechanism for Latency Sensitive Applications	197
<i>Gang Lu, Xikui Liu</i>	
Joint Optimization of Data and Computational Resource Scheduling in Computing Power Networks for Intelligent Model Training	202
<i>Zejun Su, Siya Xu, Peng Yu, Xuesong Qiu, Shu Fu, Dingshi Liao, Ping Gao</i>	
Nuggets: Enhancing Quality of Experience in Broadband Networks via a Few-Shot Content Recommendation Framework	207
<i>Yan Zhou, Danni Zhu, Xiang He, Haoxue Zhou</i>	
Capacity Analysis of Frequency Reuse Schemes for Steerable Beam in LEO Satellite Systems	213
<i>Weilong Ren</i>	
Quantum-Enhanced Attention for Federated Resource Allocation in LEO Satellite Networks	219
<i>Muhammad Ahsan Nazir, Chen Ming, Abdul Aziz, Muhammad Aurangzeb, Umar Farooq</i>	
Green Resource Allocation in Wireless Networks Via Graph Convolutional Spatio-Temporal MAPPO	226
<i>Zhenxuan Zhao, Bo Chen</i>	
Federated Multi-Agent Reinforcement Learning for Spectrum Sharing in Vehicular Networks	237
<i>Zhiwei Li, Haixia Cui, Jiahuan Wang</i>	
Beamforming Design for RIS-Assisted Mobile ISAC Systems Based on OTFS Modulation	242
<i>Ke Li</i>	
Research on “Low-Slow-Small” UAV Detection Technology Based on Active Acoustic Waves and LSTM Neural Network	247
<i>Xiang He, Haoxue Zhou, Rui Yang, Renfang Shi</i>	
Ray Tracing and Full-Wave Simulation Integrated Channel Simulation Method	252
<i>Yixiao Li, Fei Wang, Le Zhang</i>	
Joint Beamforming Design for Coupled Phase-Shift STAR-RIS Aided MIMO-ISAC Under WMMSE Framework	257
<i>Yingtong He, Yun Wu</i>	
Sensing CRB Minimization for Beyond Diagonal RIS-Assisted ISAC Systems	263
<i>Tao Jiang, Qing Xue</i>	

Scalable Visual Task Offloading in Industrial Internet of Things	268
<i>Lihua Liu, Boyang Liang, Ziyang Jia, Junchao Ma</i>	
Enhancing Security of Key Pre-Distribution in Wireless Sensor Networks via Limited Key Allocation from Key Pool	273
<i>Ching-Nung Yang, Ting-An Yan, Tsung-Chih Hsieh, Ting-Lun Hsu</i>	
Optimization Design and Implementation of a Lightweight Blockchain-Based Framework for IoT Security	278
<i>Rui Yang, Xiang He, HaoXue Zhou</i>	
A Third-Party-Independent User Credibility Evaluation Model for Quantum Communication Networks	283
<i>Jinxin Xiong, Wei Liu, Yalan Li, Hongwu Guo</i>	
Self - Organizing LoRa Network Based Ocean Observation Platform	288
<i>Shiqiang Wang, Xuan Geng, Yanli Xu</i>	
An Enhanced Direction-Based Graphical User Authentication Scheme	293
<i>Chin Soon Ku, Yang Jiin Seow, Hoong Cheng Soong, Koo Yuen Phan</i>	
Short Code with GC-Balance and Run-Length Limitation for DNA Storage	298
<i>Li'e Chen</i>	
C-GOAT: A Communications-Knowledge-Enhanced LLM with Factual-Causal Reasoning for Autonomous Network Diagnosis	304
<i>Chen ShaoHua, Zhou HaoXue, He Xiang</i>	