

2025 2nd Asia Pacific Conference on Computing Technologies, Communications and Networking (CTCNet 2025)

**Nanjing, China
26-28 December 2025**

IEEE Catalog Number: CFP259AE-POD
ISBN: 979-8-3315-7945-6



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:	CFP259AE-POD
ISBN (Print-On-Demand):	979-8-3315-7945-6
ISBN (Online):	979-8-3315-7944-9

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

Quantum Subroutine for Efficient SVD in Block-Diagonalized Precoding with fewer ancilla qubits	1
<i>Xinying Li, Xian Lu, Yongmei Li, Xin Yi, Shuai Hou, Chengkang Pan</i>	
Instability of Rain-induced Attenuation due to Rain Height Variability for Earth-Space Links operating at SHF and EHF in Cape Town, South Africa	6
<i>Yusuf Babatunde Lawal, Owolawi Pius Adewale, Chunling Tu, Etienne A. Van Wyk, Joseph Sunday Ojo</i>	
A Hybrid Framework for Network Intrusion Detection: Integrating Machine Learning, IDS, and Blockchain for Enhanced Security	14
<i>Abhijit Gaikwad</i>	
Hierarchical Adaptive Path Planning Algorithm Based on GASO-RRT*	20
<i>Wang Youming, Tong Ying, He Ruiqing, Zhang Weidong, Yuan Yexun, Li Yuqing</i>	
Robust Single-Station Position Determination in the Presence of Data Outliers	30
<i>Shijie He, Dan Song, Wei Wang</i>	
Multi-Objective Base Station Deployment Optimization in Aerial-Terrestrial Heterogeneous Networks via Adaptive Large Neighborhood Search	37
<i>Kun Song, Yixing Bao, Jing Luo, Jinglin Gao, Zhaosheng Yao, Jining Liu, Wai Kin Victor Chan</i>	
Zero-Rendered Lightweight Digital Twin Campus Network Operation and Maintenance System Based on AI Foundation	45
<i>Tong Ming, Ren Lu</i>	
Semantic-Guided Channel Denoising for Robust Wireless Image Transmission	53
<i>Huiping Liu, Xuyang Chen, Yuxi Gan, Dayang Liu, Yapeng Zhao, Daquan Feng</i>	
Towards Contribution-Fair Federated Learning: A Contract Theory based Incentive Mechanism under Dual Information Asymmetries	59
<i>Jiayi Lou, Haihang Wang</i>	
Dual-Feedback Q-Learning (DF-DQN): A Safety-Aware Deep Q-Learning Algorithm with Decision Fusion	67
<i>Jacob Ibrahim Samson, Ali Abbas</i>	
Calibration Method for Mixed-mode Return Loss Parameters of Network Cable Analyzer	74
<i>Lei Yu, Jianqiang Gao, Junwen Xia</i>	
LINI: LFM Signal Source Identification Method Based on Non-source Component Suppression and Interpretable Time-frequency Network	79
<i>Lei Yan, Siya Mi, Hao Dai, Yile Kuang</i>	
AdSig-Detector: Adversarial Signal Detection Based on Wavelet and Variational Mode Decomposition	90
<i>Zhitao Ke, Haibin Zheng, Jingjing Jin, Baiyang Ji, Xuhua Pan, Jian Jin</i>	
SigSCNN: A Computational Intelligence Approach for Signal-Specific RFF Identification in Wireless Communications	95
<i>Jian Yang, Guomin Sun, Huaizong Shao, Wei Zhang</i>	

Accelerating Cross-Spine AllToAll Communication via Bandwidth-Adaptive Allocation across Multiple Paths for Mixture-of-Expert Model Training	107
<i>Zhengxin Liu, Boyang Zhou, Yuhua Zheng, Xiang Gao, Yiwei Wang</i>	
An End-to-End Signal Detection Model for OFDM Based Power Line Communication Systems	115
<i>Xiongli Rui, Rui Chen, Xiaoyan Zhao, Jie Yang</i>	
A Dual-Channel Embedded Wireless Encrypted Lock System with Optical and RF Links Based on Optimized SM4	124
<i>Yichu Liu, He Chen, Ruoshi Zhang, Pu Wei, Yongqiang Bao</i>	
Dynamic Key-Based Certificateless Authentication Protocol for Seamless RSU switching in VANETs	132
<i>Kun Wang, Yuanyuan Zhang, Ying Fang, Yang Hu</i>	