

2025 IEEE International Performance, Computing, and Communications Conference (IPCCC 2025)

**Austin, Texas, USA
15-23 November 2025**

IEEE Catalog Number:
ISBN:

CFP25PHO-POD
979-8-3315-5287-9



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:	CFP25PHO-POD
ISBN (Print-On-Demand):	979-8-3315-5287-9
ISBN (Online):	979-8-3315-5286-2
ISSN:	1097-2641

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

Learning from the Packet Sequences: Diffusion Model-Based Protocol Greybox Fuzzing	1
<i>Xin Ren, Pengfei Wang, Peihong Lin, Xu Zhou, Wei Xie</i>	
PBC-MWF: Robust Multi-Tab Website Fingerprinting via Interval-Aggregated Packet-Burst Counts	11
<i>Yuhao Wei, Zhen Li, Gang Xiong, Gaopeng Gou, Junzheng Shi, Yingchao Qin</i>	
Adaptive Hash Ring-Based Efficient Fuzzy and Over-Threshold Multi-Party PSI	20
<i>Li Guan, Xiaodong Li, Ruoyun Zhao, Yimeng Dou, Yuan Cui, Lan Ma</i>	
DM-SCT: Side-Channel Trace Generation Via Attention-Enhanced Diffusion Model	30
<i>Yuxuan Meng, Baosheng Wang, Qianqian Xing, Xiaofeng Wang</i>	
TFMana: A Traffic Feature Calibration Method to Empower Reliable Network Traffic Analysis	39
<i>Zhengpeng Li, Shuang Zhao, Shuhui Chen, Fei Wang, Biying Wang, Minxin Wang</i>	
I Know Who You are: An Identity Mapping Attack Based on Time Series Similarity in Mobile Networks	46
<i>Wenao Zhang, Shuhui Chen, Junhong Liao, Ziling Wei, Mengyi Gong</i>	
Unsupervised Indoor Relative Positioning and Group Proximity Prediction Based on CIR Graph Convolutional Network and MDS Embedding	55
<i>Kaiqing Zhang, Xuemin Hong, Ao Peng</i>	
Semantic Segmentation in Natural Environments: An Analysis of Deep Learning Techniques	61
<i>Jahid Hasan Rony, Abdullah Al Shafi, Razib Hayat Khan, M. M. Mahbubul Syeed, Mohammad Faisal Uddin</i>	
DNSHolmes: A Scalable Framework for DNS Repair Using Large Language Models	67
<i>Kaiqiang Hu, Haizhou Du, Ziyi Wang</i>	
TrafficBM: A Dual-Modality Pre-Training Framework for Network Traffic Classification	75
<i>Minxin Wang, Junhong Liao, Jinshu Su, Ziling Wei, Shuhui Chen, Zhengpeng Li, Biying Wang</i>	
Exploiting Binary Semantics: Enhancing Function Name Inference in Stripped Binaries via LLMs	83
<i>Kailong Wang, Han Zhang, Dongliang Fang, Zhongwei Gu, Zhanwei Song, Yongle Chen, Zhiqiang Shi Limin Sun</i>	
STG-foF2: Spatio-Temporal Graph Networks for foF2 Prediction in High-Frequency Communication	92
<i>Dandan Che, Ying Li, Yi Gong</i>	
FCC: Fast Fair Congestion Control in Data Center Networks with RDMA	98
<i>Yubing Li, Qingyun Liu</i>	
SNACK: Loss Recovery Through Explicit Notification Combined with Selective Nack	108
<i>Jiasheng Wang, Yuehao Xu, Song He, Haotian Wu, Jian Yu, Zhijun Ding</i>	
Transaction-Binding Based Collateral Cost Optimization for Payment Channel Networks	116
<i>Jingjing Zhang, Yi Zhou, Daozhe Luo, Weigang Wu, Yuzhi Liang</i>	
TMAC: A Transformer-Enabled Multi-Agent Actor-Critic Method for Low-Latency XR Delivery	123
<i>Xinyu Wang, Yinlin Ren, Zhengqiu Yang, Shaoyong Guo, Qingfeng Li, Wenjing Li</i>	

Task-Oriented Semantic Communication Via Federated Learning	132
<i>Zhe Xiang, Yuandi Li, Fei Yu, Yanhao Wang, Yuehua Li, Zeyang Rao</i>	
Privacy-Preserving AI Inference in Edge Systems: Ethical and Architectural Tradeoffs	139
<i>Sunitha Kanipakam, Vishnupriya S Devarajulu, Tulasi Kavarakuntla</i>	
Energy Efficiency Optimization for Active RIS-Assisted UAV Communication Networks	145
<i>Shiqi Ren, Zhongrui Zhang, Cheng Zhan, Fei Wang, Yang Yang, Zili Zhang</i>	
Flight State Calibration of Digital Twin Models for UAV Swarms	153
<i>Zhilin Li, Xiaochang Liu, Lei Lei, Gaoqing Shen, Xiaojiao Liu, Pan Cao</i>	
Intelligent and Efficient Single-Stage Sluice Scheduling via Reinforcement Learning	160
<i>Jun Feng, Yanan Lu, Jiamin Lu, Guozhu Zhu, Wei Zhou</i>	
Hybrid Case-Based Reasoning and Kalman Filtering for Cost-Aware Multi-Hop Task Offloading in IoT Edge Networks	168
<i>Jiale Zhan, Gang Xu, Xiaodong Xu</i>	
Omni-Homomorphic Compression for Large Scientific Datasets	176
<i>Alex Fallin, Martin Burtscher</i>	
Assessing and Visualizing Completeness, Co-Coverage, and Scalability in Multivariate Time-Series Data	183
<i>Long Vu, Madeline Frank, Honghui Xu, Sisi Chen, Tu N. Nguyen, Selena He, Bobin Deng, Kun Suo</i>	
An Efficient Push-Relabel Implementation for Max-Flow Computations on GPUs	189
<i>Avery VanAusdal, Martin Burtscher</i>	
Registration and Geolocation of Aerial Thermal Images for Wildfire Monitoring	199
<i>Roberta Dal Lago Garcia, Nihar Nanjappa, Alex Alvarez, Philip Anand, Gustavo Vejarano</i>	
Exploiting Parasitic Dependency for Free-Rider Elimination in Blockchain-Based Federated Learning	208
<i>Donghang Duan, Xu Zheng, Yifu Zheng, Chong Mu, Ruozhou Wang, Ke Yan</i>	
Sum Rate Maximization for UAV-Mounted IRS-Assisted RSMA Networks with Hardware Impairments	216
<i>Habtamu Demeke Mihertie, Zhengqiang Wang, Hailay Teklehaimanot Belay</i>	
Secure and Privacy-Preserving Data Aggregation Against Malicious Gateway in RPL-Based Internet of Things	224
<i>Image Bhattarai, Cong Pu</i>	
When FinTech Meets Privacy: Securing Financial LLMs with Differential Private Fine-Tuning	233
<i>Sichen Zhu, Hoyung Leung, Xiaoyi Wang, Jia Wei, Honghui Xu</i>	
Accelerating TensorFlow Lite Micro on Embedded RISC-V Platforms via Multi-Hart Execution	239
<i>Pratik R. Kedar, Mukunda Aprameya, Mayank Mangla</i>	
Affordable Crop Disease Detection with Drone Imagery and Artificial Intelligence	243
<i>Vedant Mohapatra, Sasmita Mohapatra</i>	
Gumbel-Based Active Sparse Mobile Crowd Sensing with Time Series Transformer	248
<i>Victor Li, Carson Lam, Ting Li</i>	

Exploiting ML Task Correlation in the Minimization of Capital Expense for GPU Data Centers	254
<i>Srinivasan Subramaniyan, Xiaorui Wang</i>	
Understanding Job Configuration Impacts on Multiple Views of HPC Job Quality	262
<i>Strahinja Trecakov, Mohammad Al-Tahat, Jonathan Cook</i>	
Mitigating Syntax and Logic Errors in LLM Based Code Generation via XML-Structured Prompts	269
<i>Saket Sambaraju, Jeffrey Boman, Howell Wu, Ziliang Zong</i>	
KIS-S: A GPU-Aware Kubernetes Inference Simulator with RL-Based Auto-Scaling	276
<i>Guilin Zhang, Wulan Guo, Ziqi Tan, Qiang Guan, Hailong Jiang</i>	
On the Hidden Costs of Fairness in Byzantine-Robust Decentralized Federated Learning Under Data Heterogeneity	284
<i>Opeyemi Ajibuwa, Olusola T. Odeyomi</i>	
Secure and Efficient Vehicle-to-Vehicle Task Offloading via Trust-Aware Collaboration	292
<i>Xiaomei Zhang, Flowrence Dirisipamu, Khushi Jadhav</i>	
Trusted Medical AI: Blockchain-Backed Device Authentication With Digital Twin-Enhanced XAI for Lung Cancer Detection	301
<i>Gabriel Chukwunonso Amaizu, Akshita Maradapu Vera Venkata Sai, Zuobin Xiong, Yingshu Li</i>	
Performance Evaluation of GPU-Accelerated Molecular Dynamics Simulations with Controlled Atom Counts and Varing System Compositions	309
<i>Minsung Ko, Soohwan Jeong, Seong-Min Kim, Joongyeon Choi, Hyunggun Kim</i>	
Efficiency of LLVM Compilers on High-Performance Architectures	311
<i>Vedant Mohapatra, Sasmita Mohapatra</i>	
Patched Forecasting with Gumbel-Based Selector for Sparse Mobile Crowd Sensing	313
<i>Victor Li, Carson Lam, Ting Li</i>	
Optimizing Edge-AI on the ESP32-S3 Using SIMD	315
<i>Katherine Zhang, Hasan Poonawala</i>	
BitRL-Light: 1-Bit LLM Agents with Deep Reinforcement Learning for Energy-Efficient Smart Home Lighting Optimization	317
<i>Ravi Gupta, Shabista Haider</i>	
Comparative Study of Clustering Algorithms for Device Grouping in Wi-Fi HaLow Networks	319
<i>Md Saif Rahman, Marcelo M. Carvalho</i>	
Explaining the Black Box Through Ethical Decision Making in Large Language Models	321
<i>Julian Zarazua, Bishal Thapa, Heena Rathore</i>	
LASER: Line-Aware and Self-Balancing Learned Index for Rapid Key Lookup	323
<i>Shuaihua Zhao, Jian Zhou, Song Jiang</i>	
Modeling Rate-Distortion for Endpoint-Aware Lossy Compression in Scientific Data Transfer	331
<i>Md Hasanur Rahman, Sheng Di, Guanpeng Li, Franck Cappello</i>	
Asymmetric LEO Constellation Optimization: A Population-Based Approach	339
<i>Griffin Klevering Samantha Kissel, Li Xiao, Wolfgang Banzhaf</i>	

Dockless Electric Scooters Worldwide: Tools, Methods, and Longitudinal Analysis	345
<i>Hassan Ali Khan, Muhammad Shahzad</i>	
Turboindex: Making a Page-Based DB Index Both Memory-Space and Disk-I/O Efficient	355
<i>Sujit Maharjan, Shuaihua Zhao, Song Jiang</i>	
Gate-Breaker: An LLM-Powered Netlist-to-RTL Reverse Engineering Tool	363
<i>Md Omar Faruque, Peter Jamieson, Ahmad Patooghy, Abdel-Hameed A. Badawy</i>	
Adaptive LLM Routing for Scientific Workflows: Predicting Query Complexity to Optimize Cost	371
<i>Jonas Thierfeldt, Dominik Scheinert, Thorsten Wittkopp, Odej Kao</i>	
ALPHA: LLM-Enabled Active Learning for Human-Free Network Anomaly Detection	379
<i>Xuanhao Luo, Shivesh Madan Nath Jha, Akruti Sinha, Zhizhen Li, Yuchen Liu</i>	
Towards Profits Optimization in LLM Inference Model Deployment at the Network Edge	388
<i>Yuqi Zhang, Danyang Zheng, Huanlai Xing, Honghui Xu, Chengzong Peng, Chao Wang, Xiaojun Cao</i>	
Machine Learning and AI Classification of HPC Job Quality Using Time-Series Heartbeat Data	394
<i>Mohammad Al-Tahat, Strahinja Trecakov, Jonathan Cook</i>	
CPINN-ABPI: Physics-Informed Neural Networks for Accurate Power Estimation in MPSoCs	403
<i>Mohamed R. Elshamy, Mehdi Elahi, Ahmad Patooghy, Abdel-Hameed A. Badawy</i>	
Towards Accurate TCP Flightsize Estimation: A History-Aware Learning Approach	411
<i>Mingrui Zhang, Jianlin Zhang</i>	
Enriching Network Traffic Traces for Increasing Classification Accuracy	417
<i>Sripath Mishra, Akhil Prasad, Sonia Fahmy</i>	
A Reinforcement Learning Framework for Application-Specific TCP Congestion-Control	423
<i>Jinming Xing, Muhammad Shahzad</i>	
KRRD: An Overlay Architecture for Anti-Eavesdropping with K-Randomized Routing Dispersion	433
<i>Panzhi Du, Jiali You, Yang Li, Jun Chen</i>	
A Dual-Level Game-Theoretic Approach for Collaborative Learning in UAV-Assisted Heterogeneous Vehicle Networks	440
<i>Zihao Ding, Jun Huang, Qiang Duan, Cheng Zhang, Yanxiao Zhao, Shuyang Gu</i>	
How to Get Rid of Blockchain in Distributed Information Systems	448
<i>Michael Hofmeier, Michael Grabatin, Wolfgang Hommel</i>	
Peer Learning through Distributed Computing Research for Diverse Undergraduate Students	454
<i>Pradeeban Kathiravelu, David Moxley</i>	