The 21st Annual IFIP International Conference on Network and Parallel Computing

Nha Trang, Vietnam | 14 - 16 November 2025

NPC 2025 PROGRAM BOOK

ifip

CCF TCDCS

NANJING UNIVERSITY 1902

ĐẠI HỌC BÁCH KHOA

NTU ĐẠI HỌC NHA TRANG 1959

VINIF Powered by VinBigdata

NPC 2025

TABLE OF CONTENT

CONFERENCE INFORMATION

CONFERENCE VENUE

Sheraton Nha Trang Hotel & Spa
26-28 Tran Phu Street, Nha Trang City, Vietnam

REGISTRATION DESK OPENING TIME

Friday, 14 November 2025: 10:00 - 18:00
Saturday, 15 November 2025: 08:00 - 18:00
Sunday, 16 November 2025: 08:00 - 17:00

FUNCTION ROOMS

2 Floor	Grand Ballroom
	Grand Ballroom A
	Grand Ballroom B

REFRESHMENTS

Tea breaks are arranged in the foyer outside the meeting rooms
Buffet lunch is served at Feast Restaurant on the 1 Floor

NAME BADGES

All participants will receive a name badge, which must be worn at all times while inside the conference venue

INTERNET ACCESS

Complimentary Wi-Fi is available throughout the conference venue
Network Name (SSID): Marriott Bonvoy
Password: Not required

WELCOME RECEPTION

Venue: Foyer, 3 Floor, Sheraton Nha Trang Hotel & Spa
Date & Time: 14 November 2025, 18:00 - 20:00 (ICT)
Ticket: Entrance tickets will be provided upon registration

CONFERENCE BANQUET

Venue: Ngoc Trai Restaurant
Address: 97 Nguyen Thi Minh Khai, Nha Trang City, Vietnam
Date & Time: 15 November 2025, 18:00 - 20:00 (ICT)
Bus pickup time at Sheraton Nha Trang Hotel & Spa: 17:30 (ICT)
Bus pickup time at Ngoc Trai Restaurant (return): 20:00 (ICT)
Ticket: Entrance tickets will be provided upon registration

NPC 2025 STEERING COMMITTEE

Hai Jin	Huazhong University of Science and Technology	China
Jean-Luc Gaudiot	University of California, Irvine	USA
Stéphane Zuckerman	Université de Cergy-Pontoise	France
Chen Ding	University of Rochester	USA
Kemal Ebcioglu	Global Supercomputing	USA
Jack Dongarra	University of Tennessee	USA
Tony Hey	Science and Technology Facilities Council	UK
Yoichi Muraoka	Waseda University	Japan
Viktor Prasanna	University of Southern California	USA
Daniel Reed	University of Utah	USA
Weisong Shi	University of Delaware	USA
Ninghui Sun	The Institute of Computing Technology, CAS	China
Zhiwei Xu	The Institute of Computing Technology, CAS	China
Kien Nguyen	Chiba University	Japan
Nguyen Phi Le	Hanoi University of Science and Technology	Vietnam

NPC 2025 ORGANIZING COMMITTEE

General Chairs

- Noel Crespi, Telecom SudParis, Institut Polytechnique de Paris, France
- Jie Wu, Temple University, USA
- Baoliu Ye, Nanjing University, China

Program Co-Chairs

- Xiaoliang Wang, Nanjing University, China
- Xiaohong Jiang, Hakodate Future University, Japan

Local Chairs

- Nguyen Phi Le, Hanoi University of Science and Technology, Vietnam
- Phuoc Tran, Ton Duc Thang University, Vietnam

Publicity Co-Chairs

- Jun Zhao, Nanyang Technological University, Singapore
- Do Phan Thuan, Ton Duc Thang University, Vietnam
- Qiongxiu Li, Aalborg University, Denmark

Registration Chair

- Xiaohui Peng, The Institute of Computing Technology, CAS, China

Publication Chairs

- Jianguo Chen, Sun Yat-sen University, China
- Chen Tian, Nanjing University, China
- Xia Xie, Hainan University, China

Web and Information System Chairs

- Tingting Yuan, IMC Krems, Austria
- Rong Gu, Nanjing University, China

Finance Chairs

- Bui Thuc Minh, Nha Trang University, Vietnam
- Nguyen Cam Tu, Nanjing University, China
- Zhihao Qu, Hohai University, China

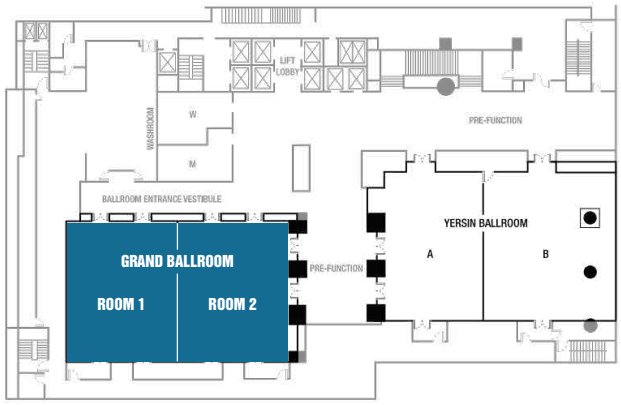
CONFERENCE SCHEDULE

DAY 1		Friday, Nov. 14, 2025
10:00 - 18:00	Conference Registration	Foyer, 2F
14:00 - 17:00	**Session 0** Optimization and Coordination: AI and Edge Networks	Online
18:00 - 20:00	**Welcome Reception**	Foyer, 3F
DAY 2		**Saturday, Nov. 15, 2025**
08:30 - 09:00	**Opening Ceremony**	Grand Ballroom, 2F
09:00 - 09:50	**Keynote 1** From Synthetic Data to Intelligent Wireless Perception: Learning to See the World Through Pervasive Radio Waves **Theofanis Raptis**	Grand Ballroom, 2F
09:50 - 10:10	Coffee Break	
10:10 - 11:00	**Keynote 2** Emotional Autonomous Driving: Opportunities and Challenges **Chengzhong Xu**	Grand Ballroom, 2F
11:00 - 11:50	**Keynote 3** New Frontiers of Edge Physical Intelligence: Extreme Quantization, Limitless Memory, and Rapid Evolution **Song Guo**	Grand Ballroom, 2F
12:00 - 13:30	Break and Lunch	Feast Restaurant, 1F
13:30 - 15:00	**Session 1** Privacy, Efficiency, and Heterogeneity	Grand Ballroom A, 2F
	Session 2 AI-Powered Security for Networks and Systems	Grand Ballroom B, 2F
15:00 - 15:20	Coffee Break	
15:20 - 17:20	**Session 3** High-Performance and Deterministic Networking	Grand Ballroom A, 2F
	Session 4 Intelligent Edge and IoT Architectures	Grand Ballroom B, 2F
18:00 - 20:00	**Banquet & Award Ceremony**	Ngoc Trai Restaurant *97 Nguyen Thi Minh Khai St.*

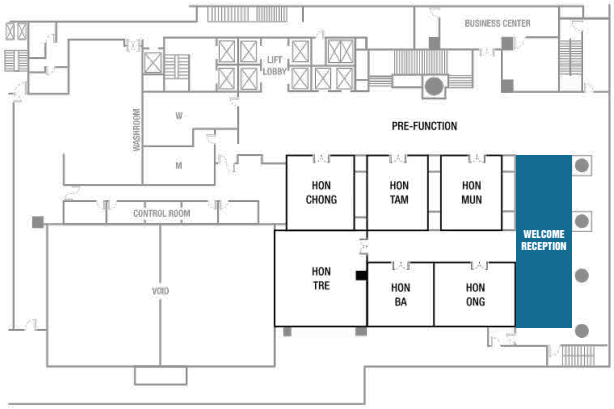
DAY 3		Sunday, Nov 16, 2025
08:30 - 10:00	**Session 5** Hardware Acceleration for AI and Distributed Systems	Grand Ballroom A, 2F
	Session 6 Scalable Resource Management for Cloud and Serverless	Grand Ballroom B, 2F
10:00 - 10:20	Coffee Break	
10:20 - 11:50	**Session 7** Performance Optimization in Distributed and Parallel Systems	Grand Ballroom A, 2F
	Session 8 Data Management and Systems Security	Grand Ballroom B, 2F
12:00 - 13:30	Break and Lunch	Feast Restaurant, 1F
13:30 - 15:00	**Session 9** Reinforcement Learning for Network and System Control	Grand Ballroom A, 2F
	Session 10 Next-Generation Mobile and Wireless Systems	Grand Ballroom B, 2F
15:00 - 15:20	Coffee Break	
15:20 - 17:20	**Session 11** AI for Vision, Language, and Prediction	Grand Ballroom A, 2F
	Session 12 Blockchain, Consensus, and Trust	Grand Ballroom B, 2F

CONFERENCE LAYOUT

LEVEL 2



LEVEL 3



SESSION 0

Optimization and Coordination: AI and Edge Networks

14:00 - 17:00 | Online Session

HBD-CE: Efficient Cross-HBD Communication for LLM Training in High-Bandwidth Domain Cluster via Hierarchical Collectives

Huihuang Qin (University of Science and Technology of China), **Shuangwu Chen** (University of Science and Technology of China), **Zijian Wen** (University of Science and Technology of China), **Zian Wang** (University of Science and Technology of China), **Ziyang Zou** (University of Science and Technology of China), **Tao Zhang** (University of Science and Technology of China), **Xiaobin Tan** (University of Science and Technology of China), and **Jian Yang** (University of Science and Technology of China)

A Digital Twin-Assisted Multi-Agent Task Offloading Method with Priority Scheduling in Vehicular Edge Networks

Taotao Yu (Zhejiang University of Technology), **Zhou Zhou** (Changsha University), and **Hongbing Cheng** (Zhejiang University of Technology)

SynergiCache: A Novel Cluster Cache for Enhancing Performance in Cloud Storage Systems

Yucheng Kang (China Telecom eSurfing Cloud), **Jiawei Li** (China Telecom eSurfing Cloud), **Chenming Chang** (China Telecom eSurfing Cloud), **Keqiang Li** (China Telecom eSurfing Cloud), **Yupeng Chen** (China Telecom eSurfing Cloud), and **Yi Zhang** (China Telecom eSurfing Cloud)

QoSmart-IoT: Secure QoS-Based Reconfiguration and Protocol Adaptation for Hybrid Clustered IoT Systems in Constrained Environments

Osama Dghriri (School of Electrical and Data Engineering, Faculty of Engineering and IT, University of Technology Sydney, Australia), **Priyadarsi Nanda** (School of Electrical and Data Engineering, Faculty of Engineering and IT, University of Technology Sydney, Australia), **Manoranjan Mohanty** (School of Information Systems, Carnegie Mellon University, Doha, Qatar), **Bashair Alrashed** (College of Computer Science and Engineering, University of Jeddah, Jeddah, Saudi Arabia), and **Ibrahim Haddadi** (Dept of Computer Engineering, College of Computer Science and Engineering, Taibah University, Saudi Arabia)

Age of Information Minimization for Secure and Covert UAV communications

Yiwen Zhang (Kunming University), **Shikai Shen** (Kunming University), **Bin Yang** (Chuzhou University), **Fei Deng** (Kunming University), **Yumei She** (Yunnan Minzu University), **Kaiguo Qian** (Kunming University), **Riyu Wang** (Kunming University) and **Kai Yang** (Kunming University)

Adaptive Anomaly Detection for IoT Networks: Improved Feature Engineering and Classification

Ayesha Sabir (Nanjing University of Science and Technology, Nanjing, China), **Song Wei** (Nanjing University of Science and Technology, Nanjing, China), **Muhammad Usman Sabir** (Virtual University, Islamabad, Pakistan) and **Abida Naz** (Central South University, Changsha, China)

DPS: A Congestion-aware Allreduce Job Placement for In-network Aggregation

Yanrong Hu, **Guannan Zhang**, **Dezun Dong**, **Zihao Wei** and **Zhen Ruan** (National University of Defense Technology)

Semantic-Driven Task-Traffic Co-Scheduling for TSN with Generalization Ability: A Heterogeneous Graph Neural Network-based Method

Zhihao Yang (Department of Automation, Shanghai Jiao Tong University), **Lei Xu** (School of Computer Science, Shanghai Jiao Tong University), **Shouliang Wang** (Department of Automation, Shanghai Jiao Tong University), **Kankan Wu** (Shanghai Institute of Satellite Engineering), **Cailian Chen** (Department of Automation, Shanghai Jiao Tong University) and **Xiaolin Wang** (Department of Mathematics, East China University of Science and Technology)

FedSM: A Federated Spectrum Management Architecture for 6G Network

Jinqi Yan (Wuhan University), **Zhili He** (Wuhan University), **Chuang Hu** (Wuhan University) and **Dazhao Cheng** (Wuhan University)

FPGA-Accelerated CNN-Transformer Hybrid Model for Real-Time Semantic Segmentation in Autonomous Driving

Ao Zhang (Tiangong University), **Yongjiang Xue** (Tiangong University), **Fei Qiao** (Tsinghua University) and **Qingzeng Song** (Tiangong University)

NNia-8: An 8-Core RISC-V Neural Network Inference Accelerator with Efficient Processing Elements and Memory Utilization

Xingbo Wang (Southern University of Science and Technology), **Yucong Huang** (Hong Kong University of Science and Technology), **Xinyu Kang** (Southern University of Science and Technology), **Yuru Li** (Southern University of Science and Technology), **Qi Wang** (The University of British Columbia) and **Terry Ye** (The Chinese University of Hong Kong (ShenZhen)

09:00 - 09:50 | Grand Ballroom - 2F

KEYNOTE 1:

From Synthetic Data to Intelligent Wireless Perception:
Learning to See the World Through Pervasive Radio Waves

Theofanis Raptis
Senior Researcher, National Research Council of Italy

ABSTRACT

As wireless networks are evolving into distributed sensors capable of perceiving and interpreting the physical world, they are no longer just channels for communication. Yet, applying deep learning to such wireless perception tasks faces a fundamental bottleneck: The scarcity and cost of real-world training data. This keynote explores how, with the help of synthetic data, we can start overcoming that barrier. It begins with deep learning approaches for hard cases of non-line-of-sight (NLOS) localization using large-scale synthetic datasets, showing how artificial radio environments can substitute for exhaustive field measurements. It then examines the sim-to-real gap in radio frequency (RF) localization, presenting evidence of how model performance degrades when moving from simulated to real conditions, and how pretraining on carefully calibrated synthetic data can substantially reduce that gap. The talk concludes with a brief look at how similar principles extend to other problems beyond device localization; for instance, combining RF signals with spatial imagery to improve urban mapping, highlighting the broader potential of learning from synthetic radio data to enable truly intelligent and perceptive wireless systems.

CV

Theofanis Raptis is a Senior Researcher at the National Research Council of Italy. He received his Ph.D. in Computer Engineering and Informatics from the University of Patras, Greece. His work spans industrial, wirelessly powered, and sensor networks, with over 100 scientific publications in these areas. In 2024, he was named among Computing's Top 30 Early Career Professionals by the IEEE Computer Society. Dr. Raptis serves on the editorial boards of *Ad Hoc Networks* and *IET Networks*, and was recognized as an Outstanding Editor of *IEEE Access* in 2018. He contributes to the International Telecommunication Union (ITU) as a multiple StandICT Fellow and helps organize leading IEEE and ACM conferences. He leads and contributes to several national and European research projects, fostering collaborations between academia and industry worldwide. His current research explores how intelligent and sustainable wireless systems can bridge the gap between digital and physical worlds.

10:10 - 11:00 | Grand Ballroom - 2F

KEYNOTE 2:

Emotional Autonomous Driving: Opportunities and Challenges

Chengzhong Xu

Dean, Faculty of Science and Technology, University of Macau

ABSTRACT

Autonomous driving is breaking the dawn of a new era, mainly due to breakthroughs of AI technologies. This talk will first give an overview of autonomous driving, including the latest end-to-end approach, and my own experience with Robotaxi. It will then present a MoEAD project for Macau Emotional Autonomous Driving, which is under development at University of Macau. It aims to develop key enabling technologies to deal with corner cases as well as hybrid traffic of human-driving and self-driving scenarios. With more and more fully autonomous driving vehicles moving on the road, they need to understand and respond to the emotions of human beings, in additional to conventional self-driving capabilities. This talk will discuss about the challenges issues in emotional autonomous driving, as well.

CV

Dr. Chengzhong Xu is a Chair Professor of Computer Science and the Dean of Faculty of Science and Technology, University of Macau, Macao SAR, China. He is also a Chief Scientist of key projects on “Internet of Things for Smart City” of Ministry of Science and Technology of China and on “Intelligent Driving” of Macau SAR Government. He was a Chief Scientist of Shenzhen Institutes of Advanced Technology (SIAT) of Chinese Academy of Sciences and the Director of Institute of Advanced Computing and Digital Engineering. Dr. Xu's recent research focuses on parallel and distributed systems, cloud and edge systems for AI, and autonomous driving. He has published over 600 papers, which have garnered more than 24K citations and have been cited in over 300 international patents (including 230 USA patents). His research has been recognized with Best Paper Awards or Nominations at top-tier conferences, including ACM SoCC’2021, IEEE HPCA’2013, IEEE HPDC’2013, IEEE Cluster’2015 and ICPP’2005, and a Test-of-Time Paper Award from Frontiers of Computer Science (2024). From 2015 to 2020, Dr. Xu chaired IEEE Technical Committee of Distributed Processing. He received his BSc (1986) and MSc (1989) in Computer Science from Nanjing University and his PhD (1993) from the University of Hong Kong. He is an IEEE Fellow in computer society.

11:00 - 11:50 | Grand Ballroom - 2F

KEYNOTE 3:

New Frontiers of Edge Physical Intelligence:
Extreme Quantization, Limitless Memory, and Rapid Evolution

Song Guo

Chair Professor, Department of Computer Science and Engineering,
Hong Kong University of Science and Technology

ABSTRACT

Physical intelligence—intelligence embodied in edge systems such as robots and autonomous vehicles—requires AI models that can not only understand and describe the world, but also act within it. Achieving this demands models that are both computationally practical and behaviorally grounded. We explore a unified approach that integrates extreme quantization to dramatically reduce computational and deployment cost, limitless memory mechanisms to support ultra-long contextual reasoning for sustained decision-making, and world-model-driven rapid evolution that enables agents to learn and evolve efficiently through interaction across simulated and real environments. These capabilities form a reinforcing cycle: efficient models make continuous learning feasible on-device; long-context memory preserves task and environmental history; and fast evolution accelerates the acquisition of physical skills. Together, they move AI from being merely expressive toward becoming embodied, adaptive, and capable of competent action in the physical world.

CV

Song Guo is a Chair Professor in the Department of Computer Science and Engineering at the Hong Kong University of Science and Technology. Prof. Guo made fundamental and pioneering contributions to the development of edge AI and machine learning systems. He has published many papers in top venues with wide impact in these areas and has been consistently recognized as a Clarivate Highly Cited Researcher. He is the recipient of IEEE 2024 Edward J. McCluskey Technical Achievement Award, and over a dozen Best Paper Awards from IEEE/ACM. Prof. Guo is the Editor-in-Chief of IEEE Transactions on Cloud Computing. He has served on IEEE Fellow Evaluation Committee for both Compuer and Communications Societies. He has also served as organizing and technical committee chair for many IEEE/ACM conferences and workshops. Prof. Guo is a Fellow of the Canadian Academy of Engineering, a Member of Academia Europaea, and a Fellow of the IEEE.

SESSION 1

Privacy, Efficiency, and Heterogeneity

13:30 - 15:00 | Room 1

FedLay: An Energy-Efficient Hierarchical Federated Learning Framework for Heterogeneous Edge Devices

Zhuopu Zhang (The Science and Technology on Information Systems Engineering Laboratory, National University of Defense Technology), **Renqi Zhu** (College of Systems Engineering, National University of Defense Technology, National University of Defense Technology), **Zongyang Yuan** (College of Systems Engineering, National University of Defense Technology, National University of Defense Technology), **Jiaqi Li** (Laboratory for Big Data and Decision, National University of Defense Technology), **Lailong Luo** (The Science and Technology on Information Systems Engineering Laboratory, National University of Defense Technology) and **Deke Guo** (School of Computer Science and Engineering, Sun Yat-sen University)

CFLBD: Distance-Informed Dynamic Clustering via Bhattacharyya Metrics for Federated Learning

Xiaowen Duan (Lanzhou university), **Rui Zhao** (Lanzhou University), **Rui Zhou** (Lanzhou university), **Lei Qiao** (Lanzhou university and Beijing Institute of Control Engineering), **Xin Liu** (Lanzhou university) and **Qingguo Zhou** (Lanzhou university)

Federated Learning via TEE-Based Dual-Branch Architecture and Interaction-Aware Pruning

Wenxuan Zhou (Hohai University), **Zhenyu Zhu** (Hohai University), **Mingyang Xie** (Queen's University) and **Zhihao Qu** (Hohai University)

Cultivator: Multi-Granularity Tree Construction in Heterogeneous Edge- Cloud Training

Meilin Ding (Tianjin University), **Yunfeng Zhao** (College of Intelligent and Computing, Tianjin University), **Chao Qiu** (College of Intelligent and Computing, Tianjin University), **Fei Gao** (College of Intelligent and Computing, Tianjin University), **Xiaofei Wang** (College of Intelligent and Computing, Tianjin University) and **Dajun Zhang** (School of Information Technology, Carleton University)

AdapDP-FR: Adaptive Differential Privacy for Federated Recommendation

Guiquan Zheng, **Meiju Yu**, **Dan Qin**, **Pantong Wang**, **Xiliang Pang**, and **Bo Wu** (Inner Mongolia University)

SESSION 2

AI-Powered Security for Networks and Systems

13:30 - 15:00 | Room 2

LGSVE: Leader-Guided Soft Voting Ensemble Model for Class-Imbalanced IoT Intrusion Detection

Shuai Zhao (Harbin Engineering University), **Huiqiang Wang** (Harbin Engineering University), **Hongwu Lv** (Harbin Engineering University), **Yifan Zou** (Harbin Engineering University) and **Runong Yang** (Harbin Engineering University)

An Unsupervised Learning Log Anomaly Detection Method Based on Graph Neural Network

Xianlang Hu (Harbin Engineering University), **Guangsheng Feng** (Harbin Engineering University), **Xinling Huang** (Harbin Engineering University), **Xiangying Kong** (Jiangsu Institute of Automation) and **Hongwu Lv** (Harbin Engineering University)

TIDF: Timing-based Device Fingerprinting for PLCs

Lei Xiang (Nanjing University of Aeronautics and Astronautics) and **Hao Han** (Nanjing University of Aeronautics and Astronautics)

Pallas: Optimizing LLM-based Anomaly Traffic Classification with Compressed Prompt Engineering

Hengxian Wang (National Key Laboratory of Information Systems Engineering, National University of Defense Technology), **Changhao Qiu** (National Key Laboratory of Information Systems Engineering, National University of Defense Technology), **Bangbang Ren** (National Key Laboratory of Information Systems Engineering, National University of Defense Technology), **Rui Chen** (National Key Laboratory of Information Systems Engineering, National University of Defense Technology), **Lailong Luo** (National Key Laboratory of Information Systems Engineering, National University of Defense Technology) and **Deke Guo** (Sun Yat-sen University)

LLM-Enhanced Heterogeneous Graph Embedding Model for DNS Security

Wenyang Jia (ICNLab, Shenzhen Graduate School, Peking University), **Jingjing Wang** (ICNLab, Shenzhen Graduate School, Peking University), **Ziwei Yan** (ICNLab, Shenzhen Graduate School, Peking University), **Tanren Liu** (SF Technology, Shenzhen, P.R.China) and **Kai Lei** (ICNLab, Shenzhen Graduate School, Peking University)

SESSION 3

High-Performance and Deterministic Networking

15:20 - 17:20 | Room 1

DCTS-RDMA: Adaptive FEC via Dynamic Coding for Efficient RDMA over Lossy Networks

Zhiyi Yang (Huazhong University of Science and Technology), **Zhexiong Li** (China University of Geosciences), **Deze Zeng** (China University of Geosciences) and **Lin Gu** (Huazhong University of Science and Technology)

Fast and Accurate RDMA Congestion Control with Self-Adapting Rate Adjustment

Xin He (Nanjing University of Posts and Telecommunications), **Zihao Zhang** (Nanjing University of Posts and Telecommunications), **Junchang Wang** (Nanjing University of Posts and Telecommunications), **Zheng Wu** (Nanjing University of Posts and Telecommunications) and **Weibei Fan** (Nanjing University of Posts and Telecommunications)

LingXi: An Architecture for COM/MON-based High-integrity TSN/TTE Switch

Pengye Xia (National University of Defense Technology), **Zhigang Sun** (National University of Defense Technology), **Weiliang Li** (National University of Defense Technology), **Yiqin Dai** (National University of Defense Technology), **Jiabo Zhang** (BFELAB, Hunan Bafei Information Technology Ltd) and **Xuyan Jiang** (National University of Defense Technology)

Open Services Availability First-Based Routing and Scheduling Optimization for Wide-Area Deterministic Networks

Shengnan Cao (College of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics), **Qiang Wu** (College of Computer Science and Technology, Zhejiang University), **Ran Wang** (College of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics) and **Shuyang Li** (College of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics)

Data Plane Driven Adaptive Routing with In-Network Reinforcement Learning

Bo Wu (inner Mongolia university), Meiju Yu (Inner Mongolia University), **Pantong Wang** (Inner Mongolia University), **Dan Qin** (Inner Mongolia University), **Xiliang Pang** (Inner Mongolia University) and **Guiquan Zheng** (Inner Mongolia University)

SESSION 4

Intelligent Edge and IoT Architectures

15:20 - 17:20 | Room 2

GPowerT: LLM-Driven Automated Programming for Power-Constrained IoT Applications

Ruitong Ye (Nanjing University of Posts and Telecommunications) and **Ming Gao** (Nanjing University of Posts and Telecommunications)

EdgeInferFlow: A Distributed Inference Acceleration Method for Deep Learning Chained Structure Models for Edge Device

Hanfeng Zhai (College of Computer Science and Software Engineering, Hohai University), **Yifan Wang** (Institute of Computing Technology, Chinese Academy of Sciences), **Xiaohui Peng** (Institute of Computing Technology, Chinese Academy of Sciences), **Lei Li** (Yunnan University) and **Xueqi Li** (Institute of Computing Technology, Chinese Academy of Sciences)

Learnable Cloud-Guided LLM Quantization for Resource-Constrained Edge Devices

Qinxiao Deng (Hohai University), **Tianfu Pang** (Hohai University), **Benteng Zhang** (Hohai University), **Bingbing Nie** (Huaneng Lancang River Hydropower Inc.), **Xiaoming He** (Nanjing University of Posts and Telecommunications), **Yingchi Mao** (Hohai University) and **Jie Wu** (Temple University)

ASALP: An Automatic Scaling Architecture for Edge Node Resources Based on Load Prediction

Hui Liu (Xidian University), **Hui Xiang** (Xidian University), **Yong Wu** (Xidian University), **Zeguang Liu** (Xidian University) and **Junzhao Du** (Xidian University)

HSC: Scalable Task Scheduling in Large-Scale Edge Environments

Wei Wang (Nanjing University of Aeronautics and Astronautics), **Zhaokang Wang** (Nanjing University of Aeronautics and Astronautics) and **Yanchao Zhao** (Nanjing University of Aeronautics and Astronautics)

A Privacy-preserving Edge Inference Framework for Low-Altitude UAV Swarm Intelligence

Jianguo Chen (Sun Yat-sen University), **Guoqing Xiao** (Hunan University), **Longxin Zhang** (Hunan University of Technology), **Guocheng Liao** (Sun Yat-sen University), **Bodong Wang** (Sun Yat-sen University) and **Weijian You** (Sun Yat-sen University)

SESSION 5

Hardware Acceleration for AI and Distributed Systems

08:30 - 10:00 | Room 1

An FPGA-Based Distributed Shared Memory Architecture Supporting CXL 2.0+ Specification

Xiuhao Huang (Huazhong University of Science and Technology), **Jinge Ding** (Huazhong University of Science and Technology), **Haikun Liu** (Huazhong University of Science and Technology), **Zhuohui Duan** (Huazhong University of Science and Technology), **Liao Xiaofei** (Huazhong University of Science and Technology) and **Hai Jin** (Huazhong University of Science and Technology)

upTSA: A DIMM-based Near Data Processing Accelerator for Time Series Analysis

Shunchen Shi (Institute of Computing Technology, Chinese Academy of Sciences; University of Chinese Academy of Sciences), **Fan Yang** (Institute of Computing Technology, Chinese Academy of Sciences; University of Chinese Academy of Sciences), **Qijia Yang** (Institute of Computing Technology, Chinese Academy of Sciences; University of Chinese Academy of Sciences), **Xiaohui Peng** (Institute of Computing Technology, Chinese Academy of Sciences; University of Chinese Academy of Sciences), **Xueqi Li** (Institute of Computing Technology, Chinese Academy of Sciences; University of Chinese Academy of Sciences) and **Ninghui Sun** (Institute of Computing Technology, Chinese Academy of Sciences; University of Chinese Academy of Sciences)

HSampler: Optimizing Multi-GPU GNN Sampling with Collision-Avoid Selection

Yuyang Jin (Tsinghua University), **Jidong Zhai** (Tsinghua University), **Kezhao Huang** (Tsinghua University) and **Weimin Zheng** (Tsinghua University)

CPU-GPU Heterogeneity Based Pipeline Parallel Architecture in Physical Layer Processing

Shiwen He (Central South University,Purple Mountain Laboratories), **Xunzhe Deng** (Central South University), Zhenyu An (Purple Mountain Laboratories), **Chengzuo Peng** (Central South University), **Linhua Liu** (Guokuan Zhiyun Technology Co., Ltd.), and **Wei Huang** (Hefei University of Technology)

Joint Optimization of Computation and Communication Resources for GPU Allocation in Heterogeneous Clusters

Jiacheng Zhu (University of Science and Technology of China), **Chu Xu** (China Mobile (Suzhou) Software Technology Co., Ltd.), **Gongming Zhao** (University of Science and Technology of China), **Hongli Xu** (University of Science and Technology of China), **Gangyi Luo** (China Mobile (Suzhou) Software Technology Co., Ltd.) and **Hao Zheng** (China Mobile (Suzhou) Software Technology Co., Ltd.)

SESSION 6

Scalable Resource Management for Cloud and Serverless

08:30 - 10:00 | Room 2

ServScale: Concurrency-aware Serverless Execution and Scaling Paradigm

Zichen Xu (Department of Computer Science and Engineering, Shanghai Jiao Tong University), **Zijun Li** (Nanyang Technological University), **Quan Chen** (Shanghai Jiao Tong University) and **Minyi Guo** (Shanghai Jiao Tong University)

TAIR: Achieving Tenant Anomaly Isolation with Request Scheduling in Serverless Computing

Junhong Lu (University of Science and Technology of China), **Chu Xu** (China Mobile (Suzhou) Software Technology Co., Ltd.), **Gongming Zhao** (University of Science and Technology of China), **Hongli Xu** (University of Science and Technology of China), **Gangyi Luo** (China Mobile (Suzhou) Software Technology Co., Ltd.) and **Hao Zheng** (China Mobile (Suzhou) Software Technology Co., Ltd.)

Carbon-Aware Task Scheduling in Distributed Computing Continuum: A Lyapunov-Guided Reinforcement Learning Approach

Shujia Niu (Yunnan University), **Zhenli He** (Yunnan University), **Yuanfei Xiao** (Yunnan University), **Yuxaun Nie** (Yunnan University), **Yao Chen** (Beijing Normal University at Zhuhai) and **Bingning Liu** (Beijing Normal University at Zhuhai)

CRANE: Two-Stage Coordinated Resource Allocation of Network and Compute for Deterministic Workloads

Yaqi Yan (China Tower Corporation Limited), **Wenlong Zhang** (China Tower Corporation Limited), **Mingui Zhang** (China Tower Corporation Limited), **Yajun Li** (China Tower Corporation Limited), **Wenrui Liu** (China Tower Corporation Limited), **Wenxuan Zhao** (Beijing University of Posts and Telecomunications), **Yuming Xing** (Beijing University of Posts and Telecomunications) and **Tian Pan** (Beijing University of Posts and Telecomunications)

Computing Measurement-Based Deployment of Service Function Chains in Computing Power Networks

Yuhan Zhang (Nanjing University of Aeronautics and Astronautics), **Ran Wang** (Nanjing University of Aeronautics and Astronautics), **Jie Hao** (Nanjing University of Aeronautics and Astronautics), **Qiang Wu** (Zhejiang University), **Zehui Xiong** (Singapore University of Technology and Design) and **Jiawen Kang** (Guangdong University of Technology)

SESSION 7

Performance Optimization in Distributed and Parallel Systems

10:00 - 10:20 | Room 1

Reducing Load-balancing Cost on Asymmetric NUMA Machine

Yuhang Fang (Shanghai Jiao Tong University), **Pu Pang** (Shanghai Jiao Tong University), **Quan Chen** (Shanghai Jiao Tong University), **Li Li** (Shanghai Jiao Tong University) and **Minyi Guo** (Shanghai Jiao Tong University)

ManuMatic: Strategy Injection for Robust Automatic Hybrid Parallelism in Distributed DNN Training

Ruiwen Wang (Sorbonne University/EURECOM/Huawei Paris Research Center), **Chong Li** (Huawei Paris Research center), **Hongxing Wang** (Huawei Paris Research center), **Appuswamy Raja** (EURECOM) and Yuan Yujie (Huawei Paris Research Center)

Millisecond-level Interference-aware Scheduling for Multi-inference Co-location on Ascend NPUs

Wenhao Huang (Tianjin University), **Fupeng Li** (Tianjin University), **Laiping Zhao** (Tianjin University), **Yeju Zhou** (HUAWEI) and **Keqiu Li** (Tianjin University)

PHITS: A Parallel Hyperlink - Induced Topic Search Algorithm with Graph Partitioning and Communication Optimization

Xuanye Chen (Suzhou University of Technology), **Xiaoshuang Xing** (Suzhou University of Technology), **Mengjiao Ou** (Suzhou University of Technology), **Jialin Chen** (Suzhou University of Technology) and **Xiaoyu Ma** (Suzhou University of Technology)

Exploiting Transformer-based Static Binary Analysis for Identifying Inefficient Locks

Zhibo Xuan (Beihang University), **Xin You** (Beihang University), **Hailong Yang** (Beihang University), **Jingqi Chen** (Beihang University), **Zhongzhi Luan** (Beihang University), **Yi Liu** (Beihang University) and **Depei Qian** (Beihang University)

FastDAG: A Low-Latency and Parallel Wave-Execution Consensus with a Double-Layer DAG

Yi Hua (Tianjin Univercity), **Xiulong Liu** (Tianjin University), **Hao Xu** (Tianjin University), **Chenyu Zhang** (Tianjin University), **Licheng Wang** (Beijing Institute of Technology) and **Keqiu Li** (Tianjin University)

Reducing Load-balancing Cost on Asymmetric NUMA Machine

Yuhang Fang (Shanghai Jiao Tong University), **Pu Pang** (Shanghai Jiao Tong University), **Quan Chen** (Shanghai Jiao Tong University), **Li Li** (Shanghai Jiao Tong University) and **Minyi Guo** (Shanghai Jiao Tong University)

SESSION 8

Data Management and Systems Security

10:00 - 10:20 | Room 2

Fluid-DataTable: Elastic and Efficient Caching for Cloud Native Big Data Query System

Wenxiao Wang (State Key Laboratory for Novel Software Technology, Nanjing University, China), **Guowang Chen** (State Key Laboratory for Novel Software Technology, Nanjing University, China), **Rong Gu** (State Key Laboratory for Novel Software Technology, Nanjing University, China), **Guoding Ji** (State Key Laboratory for Novel Software Technology, Nanjing University, China), **Chaozhong Yan** (China Mobile (Suzhou) Software Technology Company Limited, China) and **Yan Ding** (China Mobile (Suzhou) Software Technology Company Limited, China)

TriCooling-Sim: Efficient Thermal Simulation for High-Density Micro AI Data Centers

Jinyang Guo (Shanghai Jiao Tong University), **Xinkai Wang** (Shanghai Jiao Tong University), **Jing Wang** (Shanghai Jiao Tong University), **Xiaofeng Hou** (Shanghai Jiao Tong University), **Chao Li** (Shanghai Jiao Tong University) and **Minyi Guo** (Shanghai Jiao Tong University)

Image Compressive Sensing Approach Based on Mixed Precision Training and Deep Unrolling Network

Lei Feng (Jinling Institute of Technology), **Mingzhu Bian** (Jinling Institute of Technology), **Jun Zhu** (Jinling Institute of Technology), **Bo Zhang** (Jinling Institute of Technology) and **Xiuliang Zhang** (Jinling Institute of Technology)

An effective defense scheme based on SDN for DDoS attacks system

Qinghui Chen (Hunan University of Technology), **Xiaojian Song** (Hebei University of Technology), **Hong Wen** (Hunan University of Technology), **Yazhi Shi** (Hunan University of Technology) and **Zhenheng Chen** (Hunan University of Technology)

Adaptive Reed-Solomon Coding for OFDM in Mobile Visible Light Communications

Qinghui Chen (Hunan University of Technology), **Binyue Qing** (Hebei University of Technology), **Hong Wen** (Hunan University of Technology), **Ming Chen** (Hunan Normal University), **Jie Ma** (Hebei University of Technology) and **Zhenheng Chen** (Hunan University of Technology)

CGO: Cloud Game Orchestration via Resource Preception and CODEC Optimization

Taolei Wang (Shanghai Jiao Tong University), **Chao Li** (Shanghai Jiao Tong University), **Jing Wang** (Shanghai Jiao Tong University), **Xiaofeng Hou** (Shanghai Jiao Tong University) and **Minyi Guo** (Shanghai Jiao Tong University)

SESSION 9

Reinforcement Learning for Network and System Control

13:30 - 15:00 | Room 1

Role-Aware Dynamic Grouping for Efficient Coordination in Multi-Agent Reinforcement Learning

Hongxin Zhang (Sun Yat-Sen University), **Zhi Li** (South China University of Technology) and **Junbo Wang** (Sun Yat-Sen University)

LLM-Guided Soft Actor-Critic for Resource Allocation in Mobile Edge Computing Networks

Jianmeng Guo (School of Big Data & Software Engineering, Chongqing University), **Xiuhua Li** (School of Big Data & Software Engineering, Chongqing University), **Jinlong Hao** (School of Big Data & Software Engineering, Chongqing University), **Lingxiao Chen** (School of Big Data & Software Engineering, Chongqing University), **Xiaofei Wang** (College of Intelligence & Computing, Tianjin University) and **Victor C. M. Leung** (Department of Electrical & Computer Engineering, The University of British Columbia)

DDPG-Based Joint Dynamic Task Offloading and Resource Allocation for Multi-User MEC Networks

Shuang Yang (College of Electronic Communication and Electrical Engineering, Changsha University), **Xiang Xiao** (College of Electronic Communication and Electrical Engineering, Changsha University), **Peidong Zhu** (College of Electronic Communication and Electrical Engineering, Changsha University), **Lulu Wang** (College of Electronic Communication and Electrical Engineering, Changsha University), **Yu Zheng** (College of Electronic Communication and Electrical Engineering, Changsha University), **Ruihan Chen** (College of Electronic Communication and Electrical Engineering, Changsha University) and **Mingzhuo Xie** (College of Electronic Communication and Electrical Engineering, Changsha University)

LightCacheRL: A Lightweight Reinforcement Learning Framework for Unified Cache Management

Kunming Zhang (State Key Lab of Processors, Institute of Computing Technology, CAS & University of Chinese Academy of Sciences), **Zhihua Fan** (State Key Lab of Processors, Institute of Computing Technology, CAS), **Yingchun Fu** (Zhongguancun XinhaizeyouTechnology Co., Ltd), **Yanhuan Liu** (State Key Lab of Processors, Institute of Computing Technology, CAS & University of Chinese Academy of Sciences), **Lexin Wang** (State Key Lab of Processors, Institute of Computing Technology, CAS), **Yuqun Liu** (State Key Lab of Processors, Institute of Computing Technology, CAS), **Haibin Wu** (State Key Lab of Processors, Institute of Computing Technology, CAS & University of Chinese Academy of Sciences) and **Wenming Li** (State Key Lab of Processors, Institute of Computing Technology, CAS & University of Chinese Academy of Sciences)

Incremental Distributed Algorithms for Game-theoretic Betweenness Centralities in Dynamic Graphs

Yefei Wang (Huazhong University of Science and Technology), **Qiang-Sheng Hua** (Huazhong University of Science and Technology), **Wenjie Gao** (Huazhong University of Science and Technology) and **Hai Jin** (Huazhong University of Science and Technology)

SESSION 10

Next-Generation Mobile and Wireless Systems

13:30 - 15:00 | Room 2

Dynamic Resource Allocation with Adaptive Mode Selection in D2D-V2X Networks

Xiang Xiao (College of Electronic Communication and Electrical Engineering, Changsha University), **Peidong Zhu** (College of Electronic Communication and Electrical Engineering, Changsha University), **Jia Song** (College of Electronic Communication and Electrical Engineering, Changsha University), **Gang Su** (College of Electronic Communication and Electrical Engineering, Changsha University), **Lu Feng** (College of Electronic Communication and Electrical Engineering, Changsha University), **Peng Wu** (College of Electronic Communication and Electrical Engineering, Changsha University) and **Li Zhu** (College of Electronic Communication and Electrical Engineering, Changsha University)

Performance Analysis of Multipath QUIC Schedulers for Video Streaming over Hybrid 5G-Satcom Networks

Shravan Kumar Pattiwar (BITS Pilani Hyderabad Campus, India), **Paresh Saxena** (BITS Pilani Hyderabad Campus, India) and **Ozgu Alay** (University of Oslo, Norway)

Bridge the Gap Between QoS and QoE in Mobile Short Video Service: a CDN Perspective

Chuanqing Lin (Institute of Computing Technology (CAS); University of Chinese Academy of Sciences, China), **Yangguang Liang**, **Fuhua Zeng**, **Zhipeng Huang**, **Xiaodong Li**, **Jingyu Yang**, **Yu Tian** (Institute of Computing Technology (CAS); University of Chinese Academy of Sciences, China), **Gerui Lv** (Institute of Computing Technology (CAS); University of Chinese Academy of Sciences, China), **Qinghua Wu** (Institute of Computing Technology (CAS); University of Chinese Academy of Sciences, China), **Zhenyu Li** (Institute of Computing Technology (CAS); University of Chinese Academy of Sciences, China) and **Gaogang Xie** (Computer Network Information Center (CAS); University of Chinese Academy of Sciences, China)

In-Orbit Container Registry Planning for Fast Image Downloading in LEO Satellite Constellation

Lifeng Tian (China University of Geosciences, Wuhan, China), **Yuepeng Li** (China University of Geosciences, Wuhan, China), **Deze Zeng** (China University of Geosciences, Wuhan, China), **Lin Gu** (Huazhong University of Science and Technology, Wuhan, China), **Chengyu Hu** (China University of Geosciences, Wuhan, China) and **Liang Zhong** (China University of Geosciences, Wuhan, China)

ASR of CoMP-UAV Cellular Networks with Specific Eavesdropper

Yan Li (School of Computer, Changsha University of Science and Technology), **Caoshuai Zhu** (School of Computer, Changsha University of Science and Technology), **Renqi Zhu** (National Key Laboratory of Information Systems Engineering,National University of Defense Technology) and **Lailong Luo** (National Key Laboratory of Information Systems Engineering,National University of Defense Technology)

Maximizing the Utility of Multiple UAV Service Providers: A Hierarchical Cooperation Approach

Zhangzhou Li (National University of Defense Technology), **Geyao Cheng** (Information Support Force Engineering University), **Bangbang Ren** (National University of Defense Technology), **Xiaolei Zhou** (National University of Defense Technology), **Lailong Luo** (National University of Defense Technology) and **Deke Guo** (Sun Yat-sen University)

SESSION 11

AI for Vision, Language, and Prediction

15:20 - 17:20 | Room 1

A Semi-Decoupled VLM Planner with a Memory Mechanism for Autonomous Driving

Yibo Wang (School of Computer Science, Shenyang Aerospace University, Shenyang, China), **Liang Zhao** (School of Computer Science, Shenyang Aerospace University, Shenyang, China), **Ammar Hawbani** (School of Computer Science, Shenyang Aerospace University, Shenyang, China), **Saeed Hamood Alsamhi** (Centre for Data Analytics, University of Galway, Ireland and Faculty of Engineering, IBB University, Ibb, Yemen), **Zhi Liu** (Department of Computer and Network Engineering, The University of Electro-Communications, Tokyo, Japan) and **Qiang He** (School of Medicine and Biological Information Engineering, Northeastern University, Shenyang, China)

GICNet: Goal Interaction Conditioned Network for Human Trajectory Forecasting

Jie Tang (School of Computer Science and Engineering, South China University of Technology, Guangzhou 510006, China), **Ken Chen** (School of Computer Science and Engineering, South China University of Technology, Guangzhou 510006, China) and **Feihe Guo** (School of Computer Science and Engineering, South China University of Technology, Guangzhou 510006, China)

RSCAC-NET: A Remote Sensing Image Change Description Network Based on Change-Aware and Multi-Stage Global Fusion

Hongyi Dong (Inner Mongolia University), **Yan Wang** (Inner Mongolia University), **Xiuzhen He** (Inner Mongolia University), **Feilong Bao** (Inner Mongolia University) and **Bing Jia** (Inner Mongolia University)

Breaking Language Barriers : A Domain-Specific Translation Workflow for Industry

Loc Nguyen, **Minh Quan Ngo**, **Trung Chien Ha**, and **Van Minh Vu**

Long-term Cloud Workload Prediction with Multi-period Augmented LSTM

Wentao Shi (Nanjing University), **Jiarui Hu** (Nanjing University), **Xiangkai Ma** (Nanjing University), **Wenzhong** Li (Nanjing University), **Shuai Li** (State Grid Ruijia (Tianjin) Intelligent Robot Co., Ltd.) and **Sanglu Lu** (Nanjing University)

SAMSformer: A Multi-Scale Prediction Model Based on Parallel Transformer

Haiwei Xia (School of Computer Science and Technology, Hainan University, Haikou 570228, Hainan, China), **Houqun Yang** (School of Computer Science and Technology, Hainan University, Haikou 570228, Hainan, China), **Fen Chen** (Hainan Kaiqi Survey and Design Consulting Co., LTD., Haikou 570203, Hainan, China), **Hongjuan Xue** (Hainan Kaiqi Survey and Design Consulting Co., LTD., Haikou 570203, Hainan, China), **Zhengyu Li** (Faculty of Arts and Science, University of Toronto, Toronto, Ontario M5S 1A1 Canada) and **Xia Xie** (School of Computer Science and Technology, Hainan University, Haikou 570228, Hainan, China)

SESSION 12

Blockchain, Consensus, and Trust

15:20 - 17:20 | Room 2

Deadlock-Free Transaction Processing in Payment Channel Networks

Rong Cao (Sun Yat-sen University), **Jingjing Zhang** (Guangdong University of Foreign Studies), **Peizong Yang** (Sun Yat-sen University), **Litong Sun** (Sun Yat-sen University), Weigang Wu (Sun Yat-sen University) and **Jing Bian** (Sun Yat-sen University)

BlockSDN-VC: A SDN-Based Virtual Coordinate-Enhanced Transaction Broadcast Framework for High-Performance Blockchains

Wenyang Jia (ICNLab, Shenzhen Graduate School, Peking University), **Jingjing Wang** (ICNLab, Shenzhen Graduate School, Peking University), **Ziwei Yan** (ICNLab, Shenzhen Graduate School, Peking University), **Guohui Yuan** (ICNLab, Shenzhen Graduate School, Peking University), **Tanren Liu** (SF Technology, Shenzhen, P.R.China), **Yakun Ren** (SF Technology, Shenzhen, P.R.China) and **Kai Lei** (ICNLab, Shenzhen Graduate School, Peking University)

Slotqueue: A Wait-Free Distributed Multi-Producer Single-Consumer Queue with Constant Remote Operations

Do Nguyen An Huy (Ho Chi Minh City University of Technology (HCMUT), VNU-HCM), **Thanh-Dang Diep** (Ho Chi Minh City University of Technology (HCMUT), VNU-HCM), **Karl Fürlinger** (Ludwig-Maximilians-Universität (LMU) Munich, MNM Team) and **Nam Thoai** (Ho Chi Minh City University of Technology (HCMUT), VNU-HCM)

A Reputation-Driven Malicious User Detection for Truth Discovery in Mobile Crowdsensing

Dingwen Chi (Southeast University), **Jun Tao** (Southeast University), **Yu Gao** (Southeast University) and **Haotian Wang** (Southeast University)

Exploiting Hard Samples for Stealthy Backdoor Attacks on Large Language Models

Diqun Yan (College of Digital Technology and Engineering, Ningbo University of Finance and Economics) and **Rangding Wang** (College of Digital Technology and Engineering, Ningbo University of Finance and Economics)

SPECIAL THANKS TO

NPC 2025

Nha Trang, Vietnam | 14 - 16 November 2025

NPC 2025 is sponsored by the State Key Laboratory of Novel Software Technology at Nanjing University
This event is sponsored by Vingroup Innovation Foundation (VINIF)

The 21st Annual IFIP International Conference on Network and Parallel Computing (NPC 2025)
Website: https://npc-2025.github.io/index.html
Email: ifipnpc2025@gmail.com