Libin Liu Ph.D.

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Education

City University of Hong Kong — Hong Kong
Ph.D. in Computer Science and Engineering — 2016 - 2020
- Advisor: Prof. Hong Xu
- Thesis: "Accelerating Data Analytics Systems with Efficient Resource Scheduling"

Shandong University — Jinan, China
B.E. in Software Engineering — 2011 - 2015

Work Experience

Zhongguancun Laboratory | Beijing, China — 2022.09 - Present
- Assistant Researcher, core research scientist on Internet routing security.

National Supercomputer Center in Jinan | Shandong, China — 2021.08 - 2022.08
- Assistant Researcher, research on high efficient networking resource scheduling.

Huawei | Hong Kong, China — 2020.06 - 2021.07
- Researcher, Theory Laboratory, Huawei Hong Kong Researcher Center.
- Research on high-performance networking and storage system.

Research Interests

I am broadly interested in building intelligent and secure networking systems. My current focus is network operations and management, routing security, and LLM systems.

Publications

Journal Publications ("⋆" means corresponding author and "†" means co-first author.)

[J11] **Libin Liu**, Zhixiong Niu, Xiuting Xu. Reducing Makespan via Optimizing Service Applications Scheduling without Runtime Estimation. *IEEE Transactions on Services Computing*, 2025.

[J10] Wenlong Ding, **Libin Liu**, Li Chen, Hong Xu. Learning for Accelerated Traffic Engineering with Differentiable Network Modeling. *IEEE Transactions on Network Science and Engineering*, 2025.

[J9] Jingzong Li, Yik Hong Cai, **Libin Liu**, Yu Mao, Chun Jason Xue, Hong Xu. Accelerating Point Cloud Analytics on Resource-Constrained Edge Devices. *Elsevier Computer Networks*, 2025.

[J8] **Libin Liu**, Xiuting Xu. Marvel: Towards Efficient Federated Learning on IoT Devices. *Elsevier Computer Networks*, 2024.

[J7] **Libin Liu**, Jingzong Li, Zhixiong Niu, Wei Zhang, Jason Chun Xue, Hong Xu. Efficient Time-Series Data Delivery in IoT with Xender. *IEEE Transactions on Mobile Computing*, 2023.

[J6] **Libin Liu**, Jingzong Li, Hong Xu, Kaiwen Xue, Jason Chun Xue. Efficient Real-time Video Conferencing with Adaptive Frame Delivery. *Elsevier Computer Networks*, 2023.

[J5] **Libin Liu**, Hong Xu, Zhixiong Niu, Jingzong Li, Wei Zhang, Peng Wang, Jiamin Li, Jason Chun Xue, Cong Wang. ScaleFlux: Efficient Stateful Scaling in NFV. *IEEE Transactions on Parallel and Distributed Systems*, 2022.

[J4] **Libin Liu**, Chengxi Gao, Peng Wang, Hongming Huang, Jiamin Li, Hong Xu, Wei Zhang. Bottleneck-Aware Non-Clairvoyant Coflow Scheduling with Fai. *IEEE Transactions on Cloud Computing*, 2021.

[J3] **Libin Liu**, Hong Xu. Elasecutor: Elastic Executor Scheduling in Data Analytics Systems. *IEEE/ACM Transactions on Networking*, 2021.

[J2] Shuhao Liu, Hong Xu, **Libin Liu**, Wei Bai, Kai Chen, Zhiping Cai. RepNet: Cutting Latency with Flow Replication in Data Center Networks. *IEEE Transactions on Services Computing*, 2018.

[J1] Che Zhang, Hong Xu, **Libin Liu**, Zhixiong Niu, Peng Wang. Kuijia: Traffic Rescaling in Software-Defined Data Center WANs. *Security and Communication Networks*, 2018.

Conference Publications ("⋆" means corresponding author and "†" means co-first author.)

[C15] Xizheng Wang, **Libin Liu**⋆, Li Chen, Dan Li, Yukai Miao, Yu Bai. Resolving Packets from Counters: Enabling Multi-scale Network Traffic Super Resolution via Composable Large Traffic Model. *USENIX NSDI*, 2025.

[C14] Lancheng Qin, **Libin Liu**⋆, Li Chen, Dan Li, Yuqian Shi, Hongbing Yang. UniSAV: A Unified Framework for Internet-Scale Source Address Validation. *ACM/IRTF ANRW* (The only academic conference of the IETF.), 2024.

[C13] Wenlong Ding, **Libin Liu**, Li Chen, Hong Xu. ABC: Automatic Bottom-up Construction of Configuration Knowledge Base for Multi-Vendor Networks. *IEEE CogMI*, 2023.

[C12] Jingzong Li, Yik Hong Cai, **Libin Liu**, Yu Mao, Chun Jason Xue, Hong Xu. Moby: Empowering 2D Models for Efficient Point Cloud Analytics on the Edge. *ACM MM*, 2023.

[C11] Jingzong Li, **Libin Liu**†, Hong Xu, Shudeng Wu, Jason Chun Xue. Cross-Camera Inference on the Constrained Edge. *IEEE INFOCOM*, 2023.

[C10] Qing-Qing Yang, Xi Peng, Li Chen, **Libin Liu**, Jingze Zhang, Hong Xu, Baochun Li, Gong Zhang. DeepQueueNet: Torwards Scalable and Generalized Network Performance Estimation with Packet-level Visibility. *ACM SIGCOMM*, 2022.

[C9] Huangxun Chen, Yukai Miao, Li Chen, Haifeng Sun, Hong Xu, **Libin Liu**, Gong Zhang, Wei Wang. *ACM SIGCOMM*, 2022. (**This paper was awarded the Best Paper Award and was the first from China to win this accolade.**)

[C8] **Libin Liu**, Hong Xu, Chengxi Gao, Peng Wang. Bottleneck-Aware Coflow Scheduling Without Prior Knowledge. *IEEE INFOCOM ICCN*, 2020.

[C7] **Libin Liu**, Li Chen, Hong Xu, Hua Shao. Automated Traffic Engineering in SDWAN: Beyond Reinforcement Learning. *IEEE INFOCOM WNA*, 2020.

[C6] **Libin Liu**, Hong Xu. Tyrus: PHY-Assisted Neural Adaptive Congestion Control for Cellular Networks. *ACM SIGCOMM (poster)*, 2019.

[C5] **Libin Liu**, Hong Xu. Elasecutor: Elastic Executor Scheduling in Data Analytics Systems. *ACM SoCC*, 2018.

[C4] Zhixiong Niu, Hong Xu, **Libin Liu**, Yongqiang Tian, Peng Wang, Zhenhua Li. Unveiling Performance of NFV Software Dataplanes. *ACM CoNEXT CAN*, 2017.

[C3] Zhixiong Niu, Hong Xu, Dongsu Han, Peng Wang, Libin Liu. NetKernel: Network Stack as a Service in the Cloud. *USENIX NSDI*, 2017.

[C2] Che Zhang, Hong Xu, Libin Liu, Zhixiong Niu, Peng Wang, Yongqiang Tian, Chengchen Hu. Kuijia: Traffic Rescaling in Data Center WANs. *IEEE Sarnoff*, 2016.

[C1] Libin Liu, Hong Xu, Zhixiong Niu, Peng Wang, Dongsu Han. U-HAUL: Efficient State Migration in NFV. *ACM APSys*, 2016.

IETF Standards

[S7] Dan Li, Lancheng Qin, **Libin Liu**, Mingqing Huang, Kotikalapudi Sriram. Source Address Validation in Inter-domain Networks Gap Analysis, Problem Statement, and Requirements. draft-ietf-savnet-inter-domain-problem-statement, 2025 (IETF WG Standard).

[S6] Dan Li, Li Chen, Nan Geng, **Libin Liu**, Lancheng Qin. Inter-domain Source Address Validation (SAVNET) Architecture. draft-ietf-savnet-inter-domain-architecture, 2025 (IETF WG Standard).

[S5] Li Chen, Dan Li, **Libin Liu**, Lancheng Qin. Benchmarking Methodology for Intra-domain and Inter-domain Source Address Validation. draft-chen-bmwg-savnet-sav-benchmarking, 2025.

[S4] Dan Li, **Libin Liu**, Changwang Lin, Jianping Wu, Tianhao Wu, Weiqiang Cheng. YANG Data Model for Intra-domain and Inter-domain Source Address Validation (SAVNET). draft-li-savnet-sav-yang, 2025.

[S3] Dan Li, Changwang Lin, Acee Lindem, **Libin Liu**, Xueyan Song. IGP Reverse Prefix Metric. draft-li-lsr-igp-reverse-prefix-metric, 2025.

[S2] Li Chen, **Libin Liu**, Dan Li, Lancheng Qin. A Profile of Signed SAVNET-Peering Information (SiSPI) Object for Deploying Inter-domain SAVNET. draft-chen-sidrops-sispi, 2025.

[S1] Lancheng Qin, Dan Li, Li Chen, **Libin Liu**. Bicone Source Address Validation. draft-li-sidrops-bicone-sav, 2025.

CCSA Standards

[S6] Source Address Validation in Intra-domain and Inter-domain Networks (SAVNET) — General Technical Specification, China Communication Standards Association (CCSA) Industry Standard, 2025.

[S5] Source Address Validation in Intra-domain and Inter-domain Networks (SAVNET) — Technical Specification for Intra-Domain SAVNET, CCSA Industry Standard, 2025.

[S4] Source Address Validation in Intra-domain and Inter-domain Networks (SAVNET) — Technical Specification for Inter-domain SAVNET, CCSA Industry Standard, 2025.

[S3] Technical Requirement for Inter-domain SAVNET Based on Source Prefix Advertisement, CCSA Industry Standard, 2025.

[S2] Source Address Validation in Intra-domain and Inter-domain Networks (SAVNET) - Technical Specification for Resource Public Key Infrastructure (RPKI) Based Inter-domain Neighbor Discovery Method, CCSA Industry Standard, 2025.

[S1] RPKI-based Routing Security Enhancement - Technical Specification for General Resource Certificate Object and Signing Format, CCSA Industry Standard, 2025.

Awards and Honors

- Advanced Individual of Zhongguancun Laboratory 2025
- Recipient of the Beijing Overseas High-Level Talent Program 2024
- Best Paper Award, ACM SIGCOMM 2022 2022
- Huawei Excellent Employee, Huawei Hong Kong Research Center 2021
- Student Scholarship, ACM SoCC 2018 2018
- Postgraduate Scholarship, City University of Hong Kong 2016 - 2020
- Excellent Graduate of Shandong Province 2015
- CCF Outstanding Undergraduate Award, CCF 2014
- Second Prize, Chinese Undergraduate Mathematical Contest in Modeling 2013
- National Scholarship, China 2012 - 2014

Selected Projects

Source Address Validation in Intra-domain and Inter-domain Networks 2022.09 - Present

- I designed a comprehensive source address validation (SAV) framework to combat source address spoofing in Internet routing. I developed 7 IETF draft standards, including two adopted working group drafts for inter-domain SAV problem statements and architecture. I created the SAVOP open-source system to emulate and evaluate SAV mechanisms at scale, validating performance across diverse networks. This work demonstrates practical solutions for enhancing global routing security through standardized validation protocols and large-scale testing methodologies.
- This project was supported by [redacted] and was funded [redacted] hundred million RMB.

High-Performance Networking Resource Scheduling System 2016.04 - 2022.08

- I designed a dynamic resource allocation and elastic scheduling framework to optimize multi-dimensional network resource utilization. This system adapts to time-varying service demands, improving resource efficiency by 87% while maintaining QoS. I also developed a distributed deep learning inference acceleration framework for edge devices, which reduced inference latency by 71.4% under real-world datasets while preserving accuracy. I published these results in in IEEE INFOCOM, ToN, TCC, and TPDS.

Intelligent Network Configuration Management and Simulation Platform 2020.06 - Present

- I designed and implemented a unified network configuration management system to automate large-scale multi-vendor network operations. I created a vendor-agnostic configuration parsing framework that translates device-specific configurations into a normalized semantic model, reducing configuration conflicts and errors. I deployed this system in Huawei iMaster NCE-AOC, cutting new service deployment time by over 80%. Additionally, I developed a deep learning-based performance simulation system that improved network emulation speed by 21× compared to traditional discrete-event simulators. I published these results in ACM SIGCOMM (Best Paper Award), IEEE INFOCOM, and USENIX NSDI.

Teaching Experience

- TA, CityUHK CS2311 – Computer Programming 2019 Fall
- TA, CityUHK CS3402 – Database Systems 2017 - 2019 Spring
- TA, CityUHK CS5488 – Big Data Algorithms and Techniques 2016 - 2018 Fall
- TA, CityUHK CS4480 – Data-Intensive Computing 2016 - 2018 Fall

Academic Services

I have been selected as the member of **IETF Nominating Committee 2025/2026**.

- The IETF Nominations Committee, NomCom, is responsible for filling open posistions in the IETF leadership, including the IESG (that is, the Area Directors and IETF Chair), the IAB, the IETF LLC, and the IETF Trust. Full details are in RFC 8713, which can be viewed online at https://www.rfc-editor.org/rfc/rfc8713.html.

I have been reviewers for the following journals:

- ACM/IEEE Transactions on Networking
- IEEE Transactions on Parallel and Distributed Systems
- IEEE Transactions on Services Computing
- IEEE Transactions on Cloud Computing
- IEEE Transactions on Network Science and Engineering
- Elsevier Computer Networks
- Journal of Network and Computer Applications

I have served as the program commitee member for the following conferences:

- Program Vice-Chair, BigDataSE 2022
- TPC member, IEEE ScalCom 2022
- TPC member, IEEE MSN 2021
- TPC member, EMNLP 2021

References

Available upon request.