

Chaoyi Lu

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Education & Employment

2025 - Now: Research staff member

Zhongguancun Laboratory

2022 - 2025: Postdoctoral researcher

Tsinghua University

Reporting to Prof. Haixin Duan

Research Interests: Internet measurement, Network security

2017 - 2022: PhD

Tsinghua University

Advisor: Prof. Jianping Wu

Dissertation: *On Measuring Security Technologies within the Domain Name System Hierarchy*

2013 - 2017: BSc

Beijing University of Posts and Telecommunications

Research & Publications

◆ 24 peer-reviewed academic papers + 1 monograph + 1 industrial standard

◇ 18 at top-tier venues: CCS (x5), NDSS (x5), USENIX Security (x4), IMC (x3), WWW (x1)

◆ Research topics:

◇ Protocol operations measurement: encrypted DNS [8, 20], DNS servicing [15, 19, 21]

◇ Large-scale data analysis: privacy [3, 13], traffic manipulation [6-7, 22], universal acceptance [5]

◇ New security threats: denial-of-service [17-18, 25], DNS cache poisoning [9, 16, 26]

◇ Other infrastructure: Web PKI [11, 14], Email [12, 23-24], Mobile [10]

◆ Awards & community event contributions:

◇ IRTF Applied Networking Research Prize; ACM CCS Distinguished Paper Award

◇ ICANN APAC DNS Forum, IETF, BlackHat EU, IDS, OARC, ANRW

Peer-reviewed papers

- [26] **[NDSS '26]** Y. Wu, Y. Zhang, **Chaoyi Lu**, B. Liu. ***Should I Trust You? Rethinking the Principle of Zone-Based Isolation DNS Bailiwick Checking***. In Proceedings of the 33rd Network and Distributed System Security Symposium, February 2026. (To appear)
- [25] **[NDSS '26]** R. Li, **Chaoyi Lu**, B. Liu, Y. Lin, Q. Pan, et al. ***CoordMail: Exploiting SMTP Timeout and Command Interaction to Coordinate Email Middleware for Convergence Amplification Attack***. In Proceedings of the 33rd Network and Distributed System Security Symposium, February 2026. (To appear)
- [24] **[IMC '25]** R. Li, **Chaoyi Lu**, B. Liu, Y. Lin, H. Duan, et al. ***Understanding and Characterizing Intermediate Paths of Email Delivery: The Hidden Dependencies***. In Proceedings of the 25th Internet Measurement Conference, October 2025.
- [23] **[NDSS '25]** R. Li, **Chaoyi Lu**, B. Liu, Y. Zhang, G. Hong, et al. ***HADES Attack: Understanding and Evaluating Manipulation Risks of Email Blocklists***. In Proceedings of the 32nd Network and Distributed System Security Symposium, February 2025.
- [22] **[IMC '24]** Y. Xing*, **Chaoyi Lu***, B. Liu, H. Duan, J. Sun, et al. ***Yesterday Once More: Global Measurement of Internet Traffic Shadowing Behaviors***. In Proceedings of the 24th Internet Measurement Conference, November 2024. (*Co-first authors)

- [21] [\[TDSC '24\]](#) F. Zhang, B. Liu, [Chaoyi Lu*](#), Y. Xing, H. Duan, et al. **Investigating Deployment Issues of DNS Root Server Instances From a China-Wide View**. In IEEE Transactions on Dependable and Secure Computing, Volume 21, Issue 6, November 2024.
- [20] [\[WWW '24\]](#) R. Li, B. Liu, [Chaoyi Lu](#), H. Duan, J. Shao. **A Worldwide View on the Reachability of Encrypted DNS Services**. In Proceedings of the 36th Web Conference, May 2024.
- [19] [\[NDSS '24\]](#) M. Liu, Y. Zhang, X. Li, [Chaoyi Lu](#), B. Liu, et al. **Understanding the Implementation and Security Implications of Protective DNS Services**. In Proceedings of the 31st Network and Distributed System Security Symposium, February 2024.
[◇ Community event contribution: ICANN APAC DNS Forum \(Pre-event webinar\) 2024](#)
- [18] [\[CCS '23a\]](#) W. Xu, X. Li, [Chaoyi Lu](#), B. Liu, J. Zhang, et al. **TsuKing: Coordinating DNS Resolvers and Queries into Potent DoS Amplifiers**. In Proceedings of the 30th ACM Conference on Computer and Communications Security, November 2023.
[◇ Community event contribution: Black Hat Europe 2023, OARC 41](#)
- [17] [\[CCS '23b\]](#) F. Zhang, B. Liu, E. Alowaisheq, J. Chen, [Chaoyi Lu](#), et al. **Silence is not Golden: Disrupting the Load Balancing of Authoritative DNS Servers**. In Proceedings of the 30th ACM Conference on Computer and Communications Security, November 2023.
[◇ Recipient of ACM CCS Distinguished Paper Award](#)
[◇ Community event contribution: OARC 41, ICANN APAC DNS Forum \(Pre-event webinar\) 2023](#)
- [16] [\[USENIX Sec '23\]](#) X. Li, [Chaoyi Lu](#), B. Liu, Q. Zhang, Z. Li, et al. **The Maginot Line: Attacking the Boundary of DNS Caching Protection**. In Proceedings of the 32nd USENIX Security Symposium, Anaheim, CA, USA, August 2023.
- [15] [\[PAM '22\]](#) F. Zhang, [Chaoyi Lu](#), B. Liu, H. Duan, Y. Liu. **Measuring the Practical Effect of DNS Root Server Instances: A China-Wide Case Study**. In Proceedings of the 23rd Passive and Active Measurement Conference. March 2022.
[◇ Community event contribution: ICANN APAC DNS Forum 2022](#)
- [14] [\[CCS '21\]](#) Y. Zhang, B. Liu, [Chaoyi Lu](#), Z. Li, H. Duan, et al. **Rusted Anchors: A National Client-Side View of Hidden Root CAs in the Web PKI Ecosystem**. In Proceedings of the 28th ACM Conference on Computer and Communications Security, November 2021.
- [13] [\[NDSS '21\]](#) [Chaoyi Lu](#), B. Liu, Y. Zhang, Z. Li, F. Zhang, H. Duan, et al. **From WHOIS to WHOWAS: A Large-Scale Measurement Study of Domain Registration Privacy under the GDPR**. In Proceedings of the 28th Network and Distributed System Security Symposium, February 2021.
- [12] [\[USENIX Sec '21\]](#) K. Shen, C. Wang, X. Zheng, M. Guo, [Chaoyi Lu](#), et al. **Weak Links in Authentication Chains: A Large-scale Analysis of Email Sender Spoofing Attacks**. In Proceedings of the 30th USENIX Security Symposium, August 2021.
- [11] [\[CCS '20a\]](#) M. Zhang, X. Zheng, K. Shen, Z. Kong, [Chaoyi Lu](#), et al. **Talking with Familiar Strangers: An Empirical Study on HTTPS Context Confusion Attacks**. In Proceedings of the 27th ACM Conference on Computer and Communications Security, November 2020.
- [10] [\[CCS '20b\]](#) Y. Zhang, B. Liu, [Chaoyi Lu](#), Z. Li, H. Duan, et al. **Lies in the Air: Characterizing Fake-base-station Spam Ecosystem in China**. In Proceedings of the 27th ACM Conference on Computer and Communications Security, November 2020.
- [9] [\[USENIX Sec '20\]](#) X. Zheng, [Chaoyi Lu](#), J. Peng, Q. Yang, D. Zhou, et al. **Poison Over Troubled Forwarders: A Cache Poisoning Attack Targeting DNS Forwarding Devices**. In Proceedings of the 29th USENIX Security Symposium, August 2020.
[◇ Community event contribution: ICANN DNS Symposium 2021](#)

- [8] **[IMC '19] Chaoyi Lu**, B. Liu, Z. Li, S. Hao, H. Duan, et al. *An End-to-End, Large-Scale Measurement of DNS-over-Encryption: How Far Have We Come?*. In Proceedings of the 19th Internet Measurement Conference, October 2019.
 ◇ Recipient of IRTF Applied Networking Research Prize (ANRP) 2020
 ◇ Nominee of Distinguished Paper Award & Community Contribution Award
 ◇ Community event contribution: IETF 108, OARC 31
- [7] **[EuroS&P '19] B. Liu, Z. Li, P. Zong, Chaoyi Lu**, H. Duan, et al. *TraffickStop: Detecting and Measuring Illicit Traffic Monetization Through Large-scale DNS Analysis*. In Proceedings of the 4th IEEE European Symposium on Security and Privacy, June 2019.
- [6] **[USENIX Sec '18] B. Liu, Chaoyi Lu**, H. Duan, Y. Liu, Z. Li, et al. *Who Is Answering My Queries: Understanding and Characterizing Interception of the DNS Resolution Path*. In Proceedings of the 27th USENIX Security Symposium, August 2018.
 ◇ Community event contribution: ACM/IRTF ANRW '19, OARC 30
- [5] **[DSN '18] B. Liu, Chaoyi Lu**, Z. Li, Y. Liu, H. Duan, et al. *A Reexamination of Internationalized Domain Names: the Good, the Bad and the Ugly*. In Proceedings of the 48th IEEE/IFIP International Conference on Dependable Systems and Networks, June 2018.
- [4] **[EthiCS Workshop '22] Y. Zhang, M. Liu, M. Zhang, Chaoyi Lu**, H. Duan. *Ethics in Security Research: Visions, Reality, and Paths Forward*. 1st International Workshop on Ethics in Computer Security. June 2022.
 ◇ Recipient of Best Student Paper Award
- [3] **[FOCI Workshop '18] M. Zhang, B. Liu, Chaoyi Lu**, J. Zhang, S. Hao, H. Duan. *Measuring Privacy Threats in China-Wide Mobile Networks*. 8th USENIX Workshop on Free and Open Communications on the Internet, August 2018.

Monograph

- [2] **Chaoyi Lu**. (2024). *On Measuring Security Technologies within the Domain Name System Hierarchy*. Tsinghua University Press. (Monograph written in Chinese)

Industrial standard

- [1] **Chaoyi Lu**, Y. Huang, J. Zhang, H. Duan, D. Ma, et al. *Domain Name System Resolution Data Encryption Transmission Technical Requirements*. Industrial standard of telecommunication technologies of the P.R.C. (No. YD/T 4712-2024, effective Jul 2024)

Services

Internet community committee member

ICANN Security and Stability Advisory Committee (SSAC), 2024-Present
 ICANN SSAC DNSSEC Operational Considerations Work Party Co-chair, 2025-Present

Conference TPC member

EAI SecureComm '23

External reviewer

Conferences: RAID '23, NDSS '22 & '20, ICDCS '21, DSN '20, CCS '19, ESORICS '19, ICICS '19
 Journal: IEEE TNSM 2020
 Workshops: WPES '21, IoT S&P '18, RESEC '18

Teaching & Events

Community events

- Pre-event webinar moderator, ICANN APAC DNS Forum, 2024
- Plenary & pre-event webinar moderator, ICANN APAC DNS Forum, 2023

Technical training sessions

- DNSSEC training for CERNET (under support of APNIC ISIF Project), 2023
- Cybersecurity Fundamentals, Training for Malaysia Cyber 100 Initiative, 2023
- Domain Name System Fundamentals, DataCon Student Summer Camp, 2022-2024

Courses at Tsinghua University

- Invited talk, Basics of Computer Knowledge and Cultures, 2024 Fall
- Invited talk, Internet Measurement and Security Analysis, 2023 Fall
- Joint lecturer, Computer Network Security Experiments, 2023 Summer
- Teaching assistant, Basics and Cutting-Edge Topics of Cyberspace, 2020 Fall
- Teaching assistant, Computer Networks, 2019 Fall
- Teaching assistant, Computer Network Security Technologies, 2019 Spring

Awards

Academia & community

ACM CCS Distinguished Paper Award	2023
IRTF Applied Networking Research Prize (ANRP)	2020
ACM IMC Nominee of Distinguished Paper Award & Community Contribution Award	2019
IEEE/IFIP DSN Student Travel Grant	2018

Education & scholarship

Graduate Award, Education Commission of Beijing Municipality	2022 & 2017
PhD Graduate Award of Tsinghua University	2022
PhD Dissertation Award of Tsinghua University	2022
1st-Class Scholarship of Tsinghua University for Graduate Students	2021 & 2020
Cyberspace Scholarship of China Internet Development Foundation	2016