Chaoyi Lu

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Education & Employment

2022 - Present: 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

◆ **17 published papers**

  ◇ *12 at top-tier venues: NDSS [1, 7], IMC [12], USENIX Security [4, 8, 11, 14], CCS [2-3, 6, 9-10]*

◆ **Research topics:**

  ◇ *DNS protocol measurement and data analysis* [1, 5, 7, 12-15]; *DNS threats* [2-4, 11]

  ◇ *Other Internet infrastructure* [6, 8-10]

◆ **Community awards & event contributions:**

  ◇ *IRTF Applied Networking Research Prize* [12]

  ◇ *ICANN APAC DNS Forum* [5], *IDS* [11], *IETF* [12], *OARC* [2-3, 12, 14], *IRTF ANRW* [14]

Conference papers

[1] **[NDSS '24]** M. Liu, Y. Zhang, X. Li, **Chaoyi Lu**, B. Liu, et al. ***Understanding the Implementation and Security Implications of Protective DNS Services.*** To appear in Proceedings of the 31st Network and Distributed System Security Symposium, February 2024.

[2] **[CCS '23a]** W. Xu, X. Li, **Chaoyi Lu**, B. Liu, J. Zhang, et al. ***TsuKing: Coordinating DNS Resolvers and Queries into Potent DoS Amplifiers.*** To appear in Proceedings of the 30th ACM Conference on Computer and Communications Security, Copenhagen, Denmark, November 2023.
◇ Community event contribution: OARC 41

[3] **[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.*** To appear in Proceedings of the 30th ACM Conference on Computer and Communications Security, Copenhagen, Denmark, November 2023.
◇ Community event contribution: OARC 41

[4] **[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.

[5] **[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

[6] **[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.

[7] **[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.
  ◇ Coverage: Cybercrime Digest of Cybercrime Program Office of the Council of Europe (C-PROC), CERT-SE's weekly letter

[8] **[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.

[9] **[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.

[11] **[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

[12] **[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 (3/39) & Community Contribution Award (2/39)**
  ◇ Community event contribution: IETF 108, OARC 31

[13] **[EuroS&P '19]** B. Liu, Z. Li, P. Zong, **Chaoyi Lu**, H. Duan, et al. ***TrafickStop: 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.

[14] **[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: IRTF ANRW '19, OARC 30

[15] **[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.

Workshop papers

[16] **[EthiCS '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

[17] **[FOCI '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.

Industrial standard

[18] **Chaoyi Lu**, Y. Huang, J. Zhang, H. Duan, D. Ma, et al. ***Domain Name System Encryption Communication Technical Requirements.*** Industrial standard of telecommunication technologies of the P.R.C. (Announced May 2021)

Teaching & Events

Community events

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

Technical training sessions

DNSSEC training for CERNET (under support of APNIC ISIF Project), 2023
Domain Name System Fundamentals, DataCon Student Summer Camp, 2023 & 2022

Courses at Tsinghua University

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

Services

Conference TPC member

Conference: EAI SecureComm '23

External reviewers

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

Awards

Academia & community

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