Zhiyi **Zhang**

PhD Candidate · UCLA

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Summary

Fifth-year PhD candidate in computer science at UCLA. My research interests fall into /system/security, with an emphasis on problems that broadly impact society. My research projects includes security and privacy enhancement in network systems, distributed systems, and data engineering. Since I started my Ph.D., I am trying to identify and solve real-world security and privacy issues.

Education

UCLA *Los Angeles, CA, U.S.*
Ph.D. in Computer Science *Sep. 2016 - Exp. Jun. 2021*

- Supervised by Professor Lixia Zhang in the Internet Research Laboratory.
- Research fields: Network Security, Internet of Things, Information-centric Network
- Teaching Assistant of Graduate Course: Internet Architecture and Protocols
- Teaching Assistant of Undergraduate Courses: Software Construction, Computer Network

Nankai Univ. *Tianjin, China*
Bachelor of Engineering in Software Engineering *Sep. 2012 - Jun. 2016*

- Graduated with distinction: Outstanding Graduate Student Award in 2016
- The National Scholarship of China in 2015
- Earned GPA of 3.8/4.0

Experience

Internet Research Laboratory, UCLA *Los Angeles, CA, U.S.*
Doctoral Researcher *Sep. 2016 - PRESENT*

- Project lead of NDN-Lite, a NDN-based IoT Framework which enables user's local control of smart home systems.
- Project lead of El PASSO, a privacy-preserving and asynchronous **Single Sign-on** with randomizable signature and zero-knowledge proof.
- A Personally Identifiable Information(PII) sharing system with **reliable leaking source identification**.
- Project lead for the design and development of a graph-based permissioned distributed ledger system.
- Designed and implemented a NDN-based **DDoS defense** system to mitigate DDoS attacks.
- Research and Development for **Access Control Scheme** and **Certificate Management** over NDN.

Transport Security team, Facebook *(Remote) Menlo Park, CA, U.S.*
Development Internship *Jun. 2020 - Sep. 2020*

- Implemented the first-ever **TLS Batch Signature** in Fizz library for TLS 1.3 to boost TLS performance.
- Finishing a set of benchmark tools in Facebook Fizz library for **TLS 1.3 benchmarking**.
- Adding new features including Merkle Tree and NSS Key Log into Facebook Fizz library.

Infrastructure Service (AIS) team, Alibaba *Bellevue, WA, U.S.*
Research&Development Internship *Jun. 2017 - Sep. 2017*

- Building **high-performance user-mode network** stack by adjusting **QUIC** to work with kernel bypass **(DPDK)**
- Evaluation of QUIC+DPDK's performance compared with TCP+TLS+HTTP/2 and DPDK+TCP+TLS+HTTP/2
- Explored new congestion control protocol (BBR) in data center network scenario

Research Publications

Get access to all the publications: `https://zhiyi-zhang.com/publications.html`

Peer-reviewed Conference and Journal Papers

El PASSO: Pirvacy-preserving Asynchronous Single Sign-On *2021*
PETS 2021
Zhiyi Zhang, Michał Król, Alberto Sonnino, Lixia Zhang, Etienne Rivière

RapidVFetch: Rapid Downloading of Named Data via Distributed V2V Communication *2019*
IEEE Vehicular Networking Conference (VNC), pp. 290-297, Dec 2019
Zhiyi Zhang, Tianxiang Li, John Dellaverson, Lixia Zhang

A Secure Sign-On Protocol for Smart Homes over Named Data Networking *2019*
IEEE Communications Magazine, Volume:57, Issue:7, July 2019
Yanbiao Li, **Zhiyi Zhang**, Xin Wang, Edward Lu, Dafang Zhang, Lixia Zhang

Proof of Authentication for Private Distributed Ledger *2019*
NDSS on Decentralized IoT Systems and Security (DISS), 2019
Zhiyi Zhang, Vishrant Vasavada, Randy King, Lixia Zhang

Supporting Virtual Organizations Using Attribute-Based Encryption in Named Data Networking *2018*
IEEE 4th International Conference on Collaboration and Internet Computing (CIC), pp. 188-196, 2018
Craig Lee, **Zhiyi Zhang**, Yukai Tu, Alex Afanasyev, Lixia Zhang

NAC: Automating Access Control via Named Data *2018*
IEEE Military Communications Conference (MILCOM), pp. 626-633. IEEE, 2018.
Zhiyi Zhang, Yingdi Yu, Sanjeev Kaushik Ramani, Alex Afanasyev, and Lixia Zhang

An Overview of Security Support in Named Data Networking *2018*
IEEE Communications Magazine, vol. 56, no. 11, pp. 62-68, November 2018.
Zhiyi Zhang, H Zhang, E Newberry, S Mastorakis, Y Li, A Afanasyev, L Zhang

NDN Host Model *2018*
ACM SIGCOMM Computer Communication Review, 48(3), pp.35-41, 2018.
H Zhang, Y Li, **Zhiyi Zhang**, A Afanasyev, Lixia Zhang

NDN DeLorean: An authentication system for data archives in named data networking *2017*
in Proceedings of the 4th ACM Conference on Information-Centric Networking, pp.11-21. ACM, 2017.
Yu, Yingdi, Alexander Afanasyev, Jan Seedorf, **Zhiyi Zhang**, and Lixia Zhang

Peer-reviewed Short Papers & Posters

Evolving intelligent devices for the future via named data networking *2019*
XRDS: Crossroads, The ACM Magazine for Students, 2019
Zhiyi Zhang, E Lu, Y Guan, T Li, X Ma, Z Kong, L Zhang

NDNoT: A Framework for Named Data Network of Things *2018*
Best Poster Award in Proceedings of the 5th ACM Conference on Information-Centric Networking. ACM, 2018
Zhiyi Zhang, Edward Lu, Yanbiao Li, Lixia Zhang, Tianyuan Yu, Davide Pesavento, Junxiao Shi, Lotfi Benmohamed

NDNCERT: universal usable trust management for NDN *2017*
in Proceedings of the 4th ACM Conference on Information-Centric Networking. ACM, 2017.
Zhiyi Zhang, Alexander Afanasyev, and Lixia Zhang

NAC: name-based access control in named data networking *2017*
in Proceedings of the 4th ACM Conference on Information-Centric Networking. ACM, 2017.
Zhiyi Zhang, Yingdi Yu, Alexander Afanasyev, Jeff Burke, and Lixia Zhang

Preprint Papers (ongoing/under-review)

ActShare: Sensitive Data Sharing with Reliable Leaker Identification *Now*
Arxiv Preprint `https://arxiv.org/abs/1907.11833`
Zhiyi Zhang, Yu Guan, Xinyu Ma, Lixia Zhang

Expect More from the Networking: DDoS Mitigation by FITT in Named Data Networking *now*
Arxiv Preprint `https://arxiv.org/abs/1902.09033`
Zhiyi Zhang, Vishrant Vasavada, Siva Kesava Reddy K, Eric Osterweil, Lixia Zhang

DLedger: An IoT-Friendly Private Distributed Ledger System Based on DAG *now*
Arxiv Preprint `https://arxiv.org/abs/1902.09031`
Zhiyi Zhang, Vishrant Vasavada, Xinyu Ma, Lixia Zhang

Research Presentation & Talks

Get access to all the talks: `https://zhiyi-zhang.com/talks.html`

Presenter for NDN-LITE Half-day Tutorial *Macao, China*
ACM Conference on Information-Centric Networking (ICN) 2019 *Sept. 2019*
Presenter for NDN Security Concepts & Tools Half-day Tutorial *Boston, MA, U.S.*
ACM Conference on Information-Centric Networking (ICN) 2018 *Sept. 2018*

Presenter for NDNoT: A Framework for Named Data of Things　　　　　*Gaithersburg, MD, U.S.*
NDN COMMUNITY MEETING AT NIST　　　　　　　　　　　　　　　　　　*Sept. 2018*
Presenter for Distributed Ledger over NDN for A Real-world Solar System　　　*Gaithersburg, MD, U.S.*
NDN COMMUNITY MEETING AT NIST　　　　　　　　　　　　　　　　　　*Sept. 2018*

Honors & Awards

2020	**Spark Univ. Hackathon Filecoin 2nd Award out of 260 teams**, Amount 1k£, Filecoin Pricing Mechanism	*Worldwide*
2019	**UCLA Graduate Division Award**, Amount 15k$, NONRES TUITION GRANT for 2019-2020 academic year.	*Los Aneles, U.S.*
2018	**ACM ICN 2018 Best Poster Award**, NDNoT: A Framework for Named Data Network of Things	*Boston, U.S.*
2016	**Outstanding Graduate Student Award**, 4 out of 99 in Software Engineering Department, Nankai University	*Tianjin, China*
2015	**The National Scholarship of China**, 0.2% undergraduates nationwide, Chinese Department of Education	*Tianjin, China*
2015	**UCLA CSST Scholarship**, Amount 7k$, Cross-Disciplinary Scholars in Science and Technology, UCLA	*Los Angeles, U.S.*
2015	**Honorable Mention Award**, Mathematical Contest in Modeling (MCM)	*Tianjin, China*