William Xinze Zheng

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Research Interests

I am interested in building next-generation networked systems for emerging workloads and computing environments, with equal emphasis on system and networking optimization.

Education

University of Illinois Urbana-Champaign Sep 2022 – Dec 2025
BS in Computer Science & Statistics, minor in Mathematics GPA: 3.99/4.0
University of Melbourne Mar 2021 – May 2022
BS in Computer Science (Transferred to UIUC) GPA: 93.2/100

Publications

[1] Jiawei Tyler Gu, Zhen Tang, Yiming Su, Bogdan Alexandru Stoica, Xudong Sun, **William X. Zheng**, Yue Zhang, Akond Rahman, Chen Wang, Tianyin Xu. "Who Watches the Watchers? On the Reliability of Softwarizing Cloud Application Management." *23rd USENIX Symposium on Networked Systems Design and Implementation (NSDI '26)*, May 2026.

[2] **William X. Zheng**, Aryan Taneja, Maleeha Masood, Anirudh Sabnis, Ramesh Sitaraman, Deepak Vasisht. "StarCDN: Moving Content Delivery Networks to Space." *ACM Special Interest Group on Data Communication Conference (SIGCOMM '25)*, September 2025.

[3] Anna Mazhar, Saad Sher Alam, **William X. Zheng**, Yinfang Chen, Suman Nath, Tianyin Xu. "Fidelity of Cloud Emulators: The Imitation Game of Testing Cloud-based Software."*IEEE/ACM International Conference on Software Engineering (ICSE '25)*, April 2025.

Research Experience

Research Intern, Microsoft Research Beijing, China
Mentor: Dr. Jing Liu Jan 2026 – Aug 2026
Joining Systems Research Group
Research Assistant, UIUC&Princeton Champaign, IL
Mentor: Prof. Francis Y. Yan & Prof. Ravi Netravali May 2025 – Present
Real-time vision language model streaming

- Profiled and measured proprietary and open-sourced real-time vision language models.
- Co-optimizing real-time communication gateway and inference backends.
- Improving real-time user experience with long visual context support using video RAG.

Multi-party video conferencing

- Built an auto-scaling prototype for the Selective Forwarding Unit (SFU) based on Jitsi and K8s.
- Prototyped an XDP ingress accelerated SFU.
- Building open-sourced auto-scaling, cloud native, modern SFU at Pion using modern Golang Webrtc.

Research Assistant, UIUC&Akamai UIUC, Champaign, IL
Mentor: Prof. Deepak Vasisht & Prof. Ramesh K. Sitaraman May 2024 – May 2025
Satellite based CDN [2]

- Proposed StarCDN, a novel LEO satellite-based CDN architecture that achieves low latency and high bandwidth usage via consistent hashing and orbit-aware relayed fetch.
- Achieved 15% hit rate improvement against baseline LRU design.
- Independently developed and open-sourced, in collaboration with Akamai, a CDN synthetic trace generator for geographically diverse traffic with theoretically proven cache-level and object-level properties.
- Trace generator achieved sub 2% difference in caching characteristics.

Research Assistant, UIUC — Champaign, IL
Mentor: Prof. Tianyin Xu — May 2023 - Aug 2024
Cloud Management System Interaction [1]

- Studied 13 open-sourced K8s operators, and 412 reported failures to identify challenges in cloud operator reliability.
- Helped build a small tool to identify 86 new bugs that cause failure between the operator and the managed system.

Cloud and Emulator Discrepancies [3]

- Reasoned fundamental challenges in building reliable cloud service emulators via studying 10 real-world cloud-based applications and fuzzing 255 Azure and AWS APIs.
- Identified discrepancies in 37% of cloud storage APIs and dissected the root causes and manifestations into 8 findings.
- Contributed to a testing proxy middleware that automatically detects discrepancies between cloud and emulator APIs, which carries out CI workflows with high fidelity while minimizing costs.

Teaching and Mentorship

UIUC: CS438 Communication Networks: Course Assistant — Spring 2025
UIUC: CS340 Intro. Computer Systems: Course Assistant — Jan 2023 - May 2024
University of Melbourne: VCE Summer School: Specialist Math Coordinator — Winter 2021

Awards and Achievement

2026 CRA Outstanding Undergraduate Researcher Awards (Nomination, result pending)
Jeffrey P. Blahut Memorial Scholarship (4k USD)
Airwallex Outstanding Undergraduate Student (30k AUD to Top 5 of CS Department)
University of Melbourne Leader in Community Award
University of Melbourne International Student Scholarship (10k AUD)

Presentations

1. "StarCDN: Moving Content Delivery Networks to Space"
   SIGCOMM 2025, Coimbra, Sep. 11, 2025