Zhewen Yang

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Education

Johns Hopkins University — **Baltimore, MD**
Master of Science in Computer Science — *Jan 2023 - Expected Dec. 2024*
- Courses: Software Define Networks, Introduction to Human-Computer Interaction, Computer Vision, Deep Learning

Nanjing University — **Nanjing, CN**
Research Assistant in Computer Network and Systems — *Jan 2021 – Nov 2022*
- Courses: Distributed Networks, Introduction to Computation Theory, Distributed System (GPA: 3.80/4.00)

Xi'an Jiaotong University — **Xi'an, CN**
Bachelor of Engineer in Computer Science and Technology (Honors Science Program) — *Sep 2017 – Jun 2021*
- GPA: 3.47/4.00 (Honor Graduates, top 10)
- Courses: Operating Systems, Software Defined Networking, Data Structures, Analysis of Algorithms, Artificial Intelligence, Machine Learning, Computer Networking, Computer Vision

Research Experiences

Research on lossless video streaming and networking system — **HKUST, Hong Kong, CN**
Research Assistant (Supervised by Prof. Zili Meng) — *May 2024 – Now*
- Study and analyze the frontier video steaming and networking solution for high-quality transmission.
- Participating in developing the next-generation lossless video streaming framework. (ongoing project)
- A paper submitted to NSDI 2025 as 2nd author

Service-Oriented Network Stack and Architecture Development — **University of California - Berkeley, Berkeley, CA**
Researcher (Supervised by Prof. Scott Shenker) — *May 2023 – Jan 2024*
- Build new services for the new network architecture, majorly related to IPFS and HTTP3
- Build a service module related to Pub/Sub on a real cloud environment and test the capability of the service

Automatic Failure-Detecting System Development for Distributed Systems — **University of Michigan, Ann Arbor, MI**
Researcher (Supervised by Prof. Ryan Huang) — *Jan 2023 – Jan 2024*
- Analyze popular distributed systems (HBASE, Zookeeper, etc.) to find possible vulnerable components
- Design and perform major implementation and evaluation of a system to automatically detect errors and failures in distributed systems during runtime and analyze against baseline failure detectors
- Achieve a faster and more accurate detection of failures in distributed systems compared to multiple baseline checkers

In-network Bandwidth Quality-of-Service System Development — **Nanjing University, Nanjing, CN**
Lead Developer (Supervised by Prof. Chen Tian) — *Nov 2020 – Jun 2022*
- Created 3000+ line projects with NS-3 network simulator and programmable switches, using C++ and P4 languages
- Designed and developed a network bandwidth allocation system based on the end hosts to minimize in-network calculation and load scheduling time in between networks and to achieve multiple application strategies
- Achieved bandwidth utilization rate of 80% with high stability compared to 50% in previous systems
- Completed most programming tasks that contributed to research and a preprint posted to arXiv as 1st author

Norma: A High-Performance Network Tester Based on Programmable Switches — **Nanjing University, Nanjing, CN**
Developer (Supervised by Prof. Chen Tian; Collaborated with Alibaba, China) — *Nov 2021 – Jan 2022*
- Developed customizable and light-weight in-network performance testing tool by utilizing P4 language for switch hardware programming and C++ for control plan software programming
- Evaluated the system architecture, designed and implemented controlled experiments for the research group
- Ensured testing tool performance under high-speed and extreme testing environments, with high testing accuracy of around 95.5% compared to the previous result of approximately 50%, paper accepted by NSDI 2023

Runtime incremental networking data plane verification Project — **Xi'an Jiaotong University, Xi'an, CN**
Research Intern (Supervised by Prof. Peng Zhang and Prof. Hao Li) — *Sep 2020 – May 2021*
- Applied the network verification tool "batfish" on network environments and evaluated its failure detection efficiency
- Learned Differential Datalog and Soufflé (a logic programming language) and participated in developing some parts of the incremental network verification functions and testing (related to the BGP and OSPF routing)

Teaching & Mentoring Experiences

Computer Networks — **Nanjing University, Nanjing, CN**
Teaching Assistant — *Feb 2022 – May 2022*
- Prepared lectures, lab sessions on SDN, and programmable network topics for over 50 sophomore-junior undergrads
- Hosted several office hours for students on assignment and exam revise
- Participated in the design and graded course assessments to ensure students understood materials and stayed on track

Honors

- Honorary Graduate: Qualified by graduating with honors and ranking 10th among the Computer Science and Technology majors at Xi'an Jiaotong University, Xi'an, China

Publications

- Yanqing Chen, Bingchuan Tian, Chen Tian, Li Dai, Yu Zhou, Mengjing Ma, Ming Tang, Hao Zheng, **Zhewen Yang**, Guihai Chen, et al. Norma: Towards practical network load testing. In *20th USENIX Symposium on Networked Systems Design and Implementation (NSDI 23)*, pages 1733–1749, 2023.
- **Zhewen Yang**, Changrong Wu, Zhaochen Zhang, and Chen Tian. Pronet: Network-level bandwidth sharing among tenants in cloud. a*rXiv preprint arXiv:2305.02560, 2023*.
- Wei Li, **Zhewen Yang,** Zili Meng. An effective video transmission method to improve video quality with lower delay*. (*Not the actual name of the paper) Submission made to the *22nd USENIX Symposium on Networked Systems Design and Implementation (NSDI 25)*, under review.

Conference Presentations

- **Yang, Z.** (2023, April 19). *Norma: Towards Practical Network Load Testing* [Conference presentation]. 20th USENIX Symposium on Networked Systems Design and Implementation (NSDI 23), BOSTON, MA, USA

Professional Experiences

Baidu, Inc. **Beijing, CN**

Software Developer Intern *Jan 2020 – Feb 2020*

- Designed and developed end-to-end solutions, including site acceleration, continuous delivery, capacity management, elastic computing, failure analysis, traffic distribution, and performance tuning
- Designed programs of 500+ lines using C++ and Java to conduct maintenance of the Baidu Voice Assistant system and network during the Chinese New Year peak network usage period, and reduced error rate by 10%-20%
- Pitched the program to the company and successfully incorporated it into DuerOs, a popular smart home appliance

Research Interests & Skills

Research interests: Networking and Network systems, Distributed systems, Storage systems

Technical Skills: **Languages:** C++ (Advanced), Python (Advanced), C (Advanced), SQL (Advanced), Bash (Intermediate), R (Intermediate), P4 (Intermediate), JAVA (Basic), Go (Basic), Swift (Basic), Rust (Learning)

Frameworks: Scikit, PyTorch, TensorFlow, Keras, Django, Flask, NodeJS

Tools: GIT, MySQL, NS3 Network Simulator, Kubernetes, Docker