Yuyao Wang

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Research Interest

I am generally interested in topics related to the *correctness*, *programmability*, and *performance* of computer systems, with a recent focus on building expressive and performant data plane and control plane for large-scale clusters. I am currently working on scheduling in distributed systems and application networking.

Education

University of Washington **Sept. 2024 - now**
Ph.D. student in Computer Science *Advisor: Prof. Ratul Mahajan & Arvind Krishnamurthy*

Nanjing University **Sept. 2020 - June 2024**
B.S. in Computer Science *GPA: 4.71/5.00 (1/256)*

Publications

(* denotes equal contributions)

[1] HotNets'25 **User-defined Scheduling for Distributed Systems**
Yuyao Wang, Xiangfeng Zhu, Ratul Mahajan, Stephanie Wang
The 24th ACM Workshop on Hot Topics in Networks (to appear)

[2] HotOS'25 **Rethinking RPC Communication for Microservices-based Applications**
Xiangfeng Zhu, Yang Zhou, **Yuyao Wang**, Xiangyu Gao, Arvind Krishnamurthy, Sam Kumar, Ratul Mahajan, Danyang Zhuo
The ACM SIGOPS 20th Workshop on Hot Topics in Operating Systems paper ◇ slides

[3] NSDI'25 **High-level Programming for Application Networks.**
Xiangfeng Zhu, **Yuyao Wang**, Banruo Liu, Yongtong Wu, Nikola Bojanic, Jingrong Chen, Gilbert Bernstein, Arvind Krishnamurthy, Sam Kumar, Ratul Mahajan, Danyang Zhuo
The 22nd USENIX Symposium on Networked Systems Design and Implementation paper ◇ slides ◇ code

[4] NeurIPS'23 ***Is Your Code Generated by ChatGPT Really Correct?* Rigorous Evaluation of Large Language Models for Code Generation.**
Jiawei Liu*, Chunqiu Steven Xia*, **Yuyao Wang**, Lingming Zhang.
The 37th Annual Conference on Neural Information Processing Systems paper ◇ slides ◇ code

[5] ESEC/FSE'23 **NeuRI: Diversifying DNN Generation via Inductive Rule Inference.**
Jiawei Liu, Jinjun Peng, **Yuyao Wang**, Lingming Zhang.
The 31st ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering
ACM SIGSOFT Distinguished Paper Award paper ◇ slides ◇ artifact

Experience

PhD Intern, Host Networking Group, Uber **June 2025 - Sept. 2025**
Manager: Hongqiang Harry Liu *Topic: Network Chaos Testing*

- Designed and developed a CNI-based fault injection framework for L3/L4 network chaos testing.

Research Intern, System Group, UW **July 2023 - Feb. 2024**
Advised by Prof. Ratul Mahajan and Arvind Krishnamurthy *Topic: Application-Defined Networks*

- Developed `AppNet` [3], a framework for building expressive and high-performance application networks. `AppNet` can express common RPC processing tasks in only **7-28** lines of code, and its optimizations lower RPC processing latency by up to **82%**.

Research Intern, PL/FM/SE Group, UIUC **Sept. 2022 - June 2023**
Advised by Prof. Lingming Zhang *Topic: Software Testing, SE4LLM*

- Designed a benchmarking framework `EvalPlus` [4] that leverages LLM- and mutation-based methods to augment evaluation datasets with large amounts of testcases for rigorously evaluating the functional correctness of LLM synthesized code. `EvalPlus` has over **1M** downloads, and has been integrated by Google, Meta, Alibaba Qwen, DeepSeek, Amazon, etc.

- Proposed an automated fuzzing approach NeuRI [5] that leverages program synthesis to generate diverse and well-formed deep-learning models for validating DL toolchain. **100** new bugs were found for PyTorch and TensorFlow via NeuRI, of which **10** bugs are labeled *high priority* or *security vulnerability*.

Selected Awards

- ACM SIGSOFT Distinguished Paper Award (**Top 2%** of 473 ESEC/FSE submissions) Dec. 2023
- **Gold Medal**, International Collegiate Programming Contest (ICPC) Asia Regional Contest (Xi'an) Dec. 2022
- **Gold Medal**, International Collegiate Programming Contest (ICPC) Asia Regional Contest (Shanghai) Dec. 2021
- Special Scholarship for Undergraduates in Basic Science (**1/20**), Nanjing University Oct. 2022
- China National Scholarship (**Top 0.2%**) Sept. 2021
- **Silver Medal**, National Olympiad in Informatics (NOI) July 2018

Skills

- **Common:** C/C++, Python, Rust, Go, Bash, Git, Docker, LaTeX
- **Machine Learning:** PyTorch
- **Cloud Infrastructure:** Kubernetes, Istio, Envoy