Xiangfeng Zhu

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Information xfzhu@cs.washington.edu www.linkedin.com/in/xzhu

RESEARCH Interests Systems and Networking, with a focus on microservices, service mesh, and application-level networking.

EDUCATION University of Washington

Ph.D., Computer Science

Advisors: Prof. Arvind Krishnamurthy and Prof. Ratul Mahajan

University of Michigan, Ann Arbor

May 2021

xzhu27.me

Expected: June 2026

B.S., Computer Science(with honors)

Advisor: Prof. Mosharaf Chowdhury

RESEARCH EXPERIENCE Graduate Research Assistant

Sep. 2021- Now

Systems Lab, University of Washington Advisor: Prof. Arvind Krishnamurthy and Prof. Ratul Mahajan

Characterizing Service Mesh Performance Overheads

• Conduct studies on the performance overheads in using a service mesh.

Research Assistant

Dec. 2018 - Aug. 2021

Symbiotic Lab, University of Michigan

Advisor: Prof. Mosharaf Chowdhury

Fast Distributed Computation Over Slow Networks

- Co-Developed a general-purpose execution engine, Sol, that can adapt to diverse network conditions on top of Apache Spark.
- Improved SQL, machine learning, and streaming jobs by $4.2\times$ and $16.4\times$ on average, respectively, in offline and online settings compared to the state-of-theart systems in resource-constrained networks.

Efficient Participant Selection for Federated Learning

- Co-Developed a participant framework to tackle data and device heterogeneity in Federated Learning using importance sampling
- Improved time-to-accuracy performance by $1.2\times$ $14.1\times$ and final model accuracy by 1.3%-9.8% compared to state-of-the-art FL framework

Research Assistant

Mar. 2018 - Sep. 2019

Disorderly Lab, UC Santa Cruz

Advisor: Prof. Peter Alvaro

Protocol Repair Using Lineage Graphs

- Co-Designed a debugging approach for distributed systems based on analysis of data provenance obtained during system executions
- Co-Developed a standalone prototype Debugger Nemo and Evaluated it on the TaxDC collection of real-world bugs from large-scale distributed systems (e.g., Hadoop and HBase)

Publications

- 1. Fan Lai, Yinwei Dai, Sanjay S. Singapuram, Jiachen Liu, Xiangfeng Zhu, Harsha Madhyastha, Mosharaf Chowdhury, "FedScale: Benchmarking Model and System Performance of Federated Learning at Scale", Proceedings of the 39th International Conference on Machine Learning (ICML 2022), Baltimore, MD, 2022
- 2. Sebastian Burckhardt, Badrish Chandramouli, Chris Gillum, David Justo, Konstantinos Kallas, Connor McMahon, Christopher S. Meiklejohn, Xiangfeng Zhu, "Netherite: Efficient and Reliable Execution for Stateful Serverless Applications", Proceedings of the 48th International Conference on Very Large Databases (VLDB 2022), Sydney, Australia, 2022
- 3. Fan Lai, Yinwei Dai, Xiangfeng Zhu, Harsha Madhyastha, Mosharaf Chowdhury, "FedScale: Benchmarking Model and System Performance of Federated Learning", Proceedings of the First Workshop on Systems Challenges in Reliable and Secure Federated Learning (ResilientFL 2021), Virtual, 2021, Best Paper Award
- 4. Fan Lai, Xiangfeng Zhu, Harsha Madhyastha, Mosharaf Chowdhury, "Oort: Informed Participant Selection for Scalable Federated Learning", Proceedings of the 15th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2021), Virtual, 2021 (Acceptance Rate: 18.79%), Distinguished Artifact Award
- 5. Fan Lai, Jie You, **Xiangfeng Zhu**, Harsha Madhyastha, Mosharaf Chowdhury, "Sol: Fast Distributed Computation Over Slow Networks", Proceedings of the 17th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2020), Santa Clara, CA, 2020 (Acceptance Rate: 18.36%)
- 6. Lennart Oldenburg, Xiangfeng Zhu, Kamala Ramasubramanian, Peter Alvaro, "Fixed It For You: Protocol Repair Using Lineage Graphs", Proceedings of the 9th biennial Conference on Innovative Data Systems Research (CIDR 2019), Asilomar, CA, 2019

Work EXPERIENCE VMware Research

June 2022 - Sep. 2022

Incoming Research Intern

Mentor: Dr. Radhika Niranjan Mysore

Microsoft Research May 2021 - Aug. 2021

Research Intern, RiSE Group Mentor: Dr. Sebastian Burckhardt

Databricks May 2020 - Aug. 2020

Software Engineer Intern, Serverless Team

May 2019 - Aug. 2019

Software Engineer Intern, Filesystem Team

Professional ACTIVITIES

- Program Committee: NeurIPS(Datasets and Benchmarks Track) 2022, EuroSys 2022 (Shadow PC), IMC 2022 (Shadow PC)
- Student Volunteer: SoCC 2021, SIGCOMM 2021
- Artifact Evaluation Committee: SIGCOMM 2021, OSDI 2021, EuroSys 2021, JSys 2021

- OTHER ACTIVITIES Area Chair (System): UW CSE PhD Admissions Committe, 2022
 - Reader: UW CSE PhD Admissions Committe, 2021
 - Mentor: UW CSE PhD Pre-Application Mentorship Service (PAMS), 2021

Honors & Awards

- Best Paper Award, ACM SOSP ResilientFL, 2021 For FedScale: Benchmarking Model and System Performance of Federated Learning
- Distinguished Artifact Award, USENIX OSDI, 2021 For Oort: Efficient Federated Learning via Guided Participant Selection
- Allen School Computer Science & Engineering Research Fellowship, 2021
- Conference Student Grant, HotNets '22, OSDI '20, FAST '21, NSDI '21, OSDI '21, HotNets '22