Xiangfeng Zhu

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Research Interests Systems and Networking, with a focus on systems for emerging large-scale workloads

Education

University of Washington Expected: June 2026

Ph.D.., Computer Science

Advisors: Prof. Arvind Krishnamurthy and Prof. Ratul Mahajan

University of Michigan, Ann Arbor May 2021

B.S., Computer Science(with honors)

Thesis: Toward Real-time Systems for Vision and Language Applications

Advisor: Prof. Mosharaf Chowdhury

Research Experience

Research Assistant Sep. 2021- Now
Systems Lab, University of Washington
Advisosr: 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× and 16.4× on average, respectively, in offline and online settings compared to the state-of-the-art systems in resource-constrained networks.

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× - 14.1× and final model accuracy by 1.3%-9.8% compared to state-of-the-art FL framework

Undergraduate Researcher 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)

Undergraduate Researcher Mar. 2017 - Aug. 2017
Storage System Research Center, UC Santa Cruz
Worked under: Prof. Darrell D. E. Long and Prof. Ethan L. Miller

Rogue Cell tower(IMSI Catcher) detector

- Wrote a design document with three lab partners detailing the project and future work.
- Co-Designed an algorithm to pinpoint the location of IMSI Catchers based on received signal strength (RSS) and signal spike

Publications

1. 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", *Under Review*
2. 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**
3. 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**
4. 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%)
5. 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

Microsoft Research May 2021 - Aug. 2021
Research Intern , RiSE Group
Mentor: Dr. Sebastian Burckhardt

Databricks May 2020 - Aug. 2020
Software Engineer Intern , Serverless Team

Dropbox May 2019 - Aug. 2019
Software Engineer Intern , Filesystem Team

Professional Activities

- **Program Committee**: EuroSys 2022(Shadow PC)
- **Student Volunteer**: SoCC 2021, SIGCOMM 2021
- **Artifact Evaluation Committee**: SIGCOMM 2021, OSDI 2021, EuroSys 2021, JSys 2021

Other Activities

- **Mentor**:UW CSE PhD program Pre-Application Mentorship Service (PAMS), 2021

Awards

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

Skills

- **Programming**: Java, C, C++, Python, Scala, Bash, SQL, HTML, CSS, LaTeX
- **Tools**: Perf, GDB, Valgrind, Make, Git, Vim, Docker

Miscellaneous

- **Personal Blog**: xzhu0027.gitbook.io/blog/