Xiangfeng Zhu

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 $Research \qquad \qquad Cloud \ Computing, \ Distributed \ Systems, \ Systems \ for \ ML/Big \ Data, \ Federated \ Computation,$

Interests Edge Computing

EDUCATION University of Michigan, Ann Arbor Expected: May 2021

B.S., Computer Science(with honors)

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

Research Assistant Dec. 2018 - Now

EXPERIENCE 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-theart 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

System for complex vision and language applications

• Collaborating with Prof. Junchen Jiang at University of Chicago

• Designing a system for real-time, complex computer vision and natural language processing applications for visually impaired users

Undergraduate Researcher 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

Mar. 2018 - Sep. 2019

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

- Fan Lai, Xiangfeng Zhu, Harsha Madhyastha, Mosharaf Chowdhury, "Oort: Informed Participant Selection for Scalable Federated Learning", arXiv:2010.06081, Submitted to OSDI' 21
- 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%)
- 3. 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 19)*, Asilomar, CA, 2019

Work Experience **Databricks**

May 2020 - Aug. 2020

Software Engineer Intern, Serverless Team

Dropbox

May 2019 - Aug. 2019

Software Engineer Intern , Filesystem Team

Professional Activities

- EuroSys: Artifact Evaluation Committee, 2021
- Journal of Systems Research (JSys): Artifact Evaluation Board, 2021

OTHER EXPERIENCE

- CMPE107: Probability and Statistics , UC Santa Cruz , Grader Spring 2018
- CMPS12B: Introduction to Data Structures, UC Santa Cruz , Learning Assistant Spring 2018, Winter 2018
- CMPS101: Algorithms and Abstract Data Types, UC Santa Cruz , Learning Assistant Fall 2017, Winter 2018

AWARDS

- Conference Student Grant, OSDI' 20, FAST' 21
- Dean's Honor List: Fall 2016, Winter 2017, Spring 2017, Winter 2018, Spring 2018

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/