Xiangfeng Zhu

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Research Interests Cloud Computing, Distributed Systems, Systems for ML/Big Data, Federated Learning, Video Analytics

Education

University of Michigan, Ann Arbor — Expected: Dec 2020

B.S., Computer Science

Univeristy of California, Santa Cruz — Transferred

B.S., Computer Science

Research Experience

Research Assistant — Dec. 2018 - Now
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 4.2X and 16.4X on average, respectively, in offline and online settings compared to Apache Spark in resource-constrained networks.

Participant Selection for Federated Learning

- Co-Developing a device management framework for client selection to tackle data and device heterogeneity in Federated Learning

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

Undergraduate Researcher — Mar. 2018 - Sep. 2019
Disorderly Lab, UC Santa Cruz
Advisor: Prof. Peter Alvaro

Nemo: Protocol Repair Using Lineage Graphs

- Co-Designed a debugging approach for distributed systems based on analysis of provenance data obtained during system executions
- Co-Developed a standalone prototype Debugger Nemo and Evaluated our approach on the TaxDC collection of real-world bugs from large-scale distributed systems.
- Demonstrated the promise of automatic provenance-guided debugging for complex distributed protocols.

Undergraduate Researcher — Aug. 2017 - Feb. 2018
Computer Communication Research Group, UC Santa Cruz
Advisor: Prof. J.J. Garcia-Luna-Aceves

CUP: Channel-Utilization Persistence for MAC protocols

- Helped design the first transmission strategy, Channel-Utilization Persistence(CUP), for contention-based MAC protocols which applies to any MAC protocols with carrier sensing, virtual carrier sensing, or priority acknowledgments.
- Analyzed the efficiency of Channel-Utilization Persistence MAC protocols, such as CUP-CSMA and CUP-CSMA/CA, using Markov Chains.
- Presented numerical results that compare the throughput of CUP-CSMA, non-persistent CSMA, and 1-persistent CSMA.

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)

Work Experience

Software Engineer Intern, Databricks May 2020 - Aug. 2020

Software Engineer Intern, Dropbox May 2019 - Aug. 2019

Software Engineer Intern, Hainan Airline Jun. 2018 - Aug. 2018

Publications

1. 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

2. 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

Other Experience

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

Awards

- **Dean's Honor List:** Fall 2016, Winter 2017, Spring 2017, Winter 2018, Spring 2018

Skills

- **Language**: English, Chinese
- **Programming**: Java, C, C++, Python, Bash, SQL, HTML, CSS, LaTeX
- **Platform**: Mac OS, Windows, Linux
- **Tools**: Perf, GDB, Valgrind, Make, Git, Vim, Docker

References

Dr. J.J. Garcia-Luna-Aceves University of California, Santa Cruz
Distinguished Professor of Computer Science and Engineering
Jack Baskin Endowed Chair of Computer Engineering
Phone: 831-459-4153 E-mail: jj@soe.ucsc.edu

Dr. Peter Alvaro University of California, Santa Cruz
Assistant Professor of Computer Science and Engineering
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Chris Parsa University of California, Santa Cruz
Adjunct lecturer of of Computer Science and Engineering
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