

RESEARCH INTERESTS Networking, Cloud Computing, Distributed System, Systems for machine learning/artificial intelligence-based data analytics

B.S., Computer Science

- GPA: 3.94/4.00

- 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 Apache Spark in resource-constrained networks.

- 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. Our experimental result shows that Nemo demonstrates the promise of automatic provenance-guided debugging for complex distributed protocols.

- Designing a tracer and a fault injector using system-level provenance for unmodified distributed systems
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CUP: Channel-Utilization Persistence for MAC protocols

- Helped Professor J.J. design the first transmission strategy(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

Rogue Cell tower(IMSI Catcher) detector

- Wrote a design document with three lab partners detailing the project and future work. Our approach includes Neighboring Cell Tower Information, Absence of Encryption and Signal Strength.
- Designed an algorithm to pinpoint the location of IMSI Catchers based on received signal strength (RSS)
- Wrote C code to communicate with a SIMCOM module via AT commands and a GPS module

INTERN EXPERIENCE

Software Engineer Intern, Dropbox

May 2019 - Aug. 2019

Filesystem Team

- Worked on the next-generation distributed filesystem for Dropbox
- Designed and implemented an asynchronous system to unmount namespaces that a user loses access to
- Redesigning our Mapreduce framework to be more efficient and fault-tolerant using RocksDB and gRPC

PROJECTS

Distributed Debugger Using Provenance Graph

2018

- Designed a lineage-driven distributed debugger(Nemo) with graduate students that can analyze the program and give suggestions to the programmer how and where to correct the program

Fault-tolerant Scalable Key-Value Store

2018

- Developed a distributed, fault-tolerant key-value store that can store the amount of data that cannot fit into one single machine, using consistent hashing.

Chess Puzzle Solver

2017

- Wrote a program that can determine if a player can force checkmate in up to 5 steps, including the moves of the opponent.

Online Reservation system

2017

- Designed an online reservation app for Manyue Yoga Stadium, on-line payment system, and on-line community for member to share their experience.

PUBLICATIONS

1. Fan Lai, Jie You, **Xiangfeng Zhu**, Mosharaf Chowdhury, Harsha Madhyastha, "Sol: Fast Distributed Computation Over Slow Networks", *under review*
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	<ul style="list-style-type: none"> • CMPE107: Probability and Statistics , UC Santa Cruz , Grader Spring 2018 • CMPS12B: Introduction to Data Structures, UC Santa Cruz , Tutor Spring 2018 • CMPS12B: Introduction to Data Structures, UC Santa Cruz , Lab Tutor Winter 2018 • CMPS101: Algorithms and Abstract Data Types, UC Santa Cruz , Tutor Fall 2017 • CMPS101: Algorithms and Abstract Data Types, UC Santa Cruz , Grader Fall 2017
AWARDS	<ul style="list-style-type: none"> • Dean's Honor List: Fall 2016, Winter 2017, Spring 2017, Winter 2018, Spring 2018
SKILLS	<ul style="list-style-type: none"> • Language: English, Chinese • Programming: Java, C, C++, Python, Go, Scala, Bash, SQL, HiveQL, HTML, CSS, \LaTeX, JavaScript(Limited) • Platform: Mac OS, Windows, Linux • Tools: Perf, GDB, Valgrind, Make, Git, Vim, Neo4j, Docker • Data: Oracle, MySQL, Hadoop, Hive, Spark, Flink, ZooKeeper, BookKeeper
REFERENCES	<p>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</p> <p>Dr. Peter Alvaro University of California, Santa Cruz Assistant Professor of Computer Science and Engineering Phone: 415-813-9364 E-mail: palvaro@ucsc.edu</p> <p>Chris Parsa University of California, Santa Cruz Adjunct lecturer of of Computer Science and Engineering Phone: 831-252-9033 E-mail: cparsa@ucsc.edu</p>