

## Xiangfeng Zhu

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CONTACT INFORMATION	3510 Murdoch Dr. Palo Alto, CA 94306 xzhu27.me	650-660-0918 zxfeng@umich.edu www.linkedin.com/in/xzhu
RESEARCH INTERESTS	Networking, Cloud Computing, Distributed System, Operating System	
EDUCATION	<b>University of Michigan, Ann Arbor</b> B.S., Computer Science <ul style="list-style-type: none"><li>GPA: 4.00/4.00</li></ul> <b>Univeristy of California, Santa Cruz</b> B.S., Computer Science <ul style="list-style-type: none"><li>GPA: 3.94/4.00</li></ul>	Expected: May 2020  Sep. 2016 - June. 2018
RESEARCH EXPERIENCE	<b>Research Assistant</b> <b>Software System Lab, University of Michigan</b> <b>Advisor:</b> Prof. Mosharaf Chowdhury <i>Sol: Fast Distributed Computation Over Slow Networks</i> <ul style="list-style-type: none"><li>Co-developing a general-purpose execution engine, Sol, that can adapt to diverse network conditions on top of Apache Spark.</li><li>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.</li></ul> <b>Undergraduate Researcher</b> <b>Disorderly Lab, UC Santa Cruz</b> <b>Advisor:</b> Prof. Peter Alvaro <i>Protocol Repair Using Lineage Graphs</i> <ul style="list-style-type: none"><li>Developed a debugging approach based on analysis of provenance data obtained during system executions equipped with correctness specifications. Our approaches require programs and their correctness properties written in a high-level declarative language.</li><li>Helped Design a standalone prototype Debugger Nemo and validated Nemo on protocols from real-world distributed bugs. Our experimental result shows that Nemo demonstrates the promise of automatic provenance-guided debugging for complex distributed protocols.</li></ul> <b>Undergraduate Researcher</b> <b>Computer Communication Research Group, UC Santa Cruz</b> <b>Advisor:</b> Prof. J.J. Garcia-Luna-Aceves <i>CUP: Channel-Utilization Persistence for MAC protocols</i> <ul style="list-style-type: none"><li>Helped Professor J.J. design the first transmission strategy(CUP) for contention-based MAC protocols. This approach applies to any MAC protocols with carrier sensing, virtual carrier sensing, or priority acknowledgments.</li><li>Analyzed the efficiency of Channel-Utilization Persistence MAC protocols, such as CUP-CSMA and CUP-CSMA/CA, using Markov Chains.</li><li>Presented numerical results that compare the throughput of CUP-CSMA, non-persistent CSMA, and 1-persistent CSMA.</li></ul>	Dec. 2018 - Now          Mar. 2018 - Sep. 2018    Aug. 2017 - Feb. 2018

**Undergraduate Researcher**  
**Storage System Research Center, UC Santa Cruz**  
**Worked under:** Prof. Darrell D. E. Long

Mar. 2017 - Aug. 2017

*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

## 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

- **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

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

## SKILLS

- **Language:** English, Chinese
- **Programming:** Language: Java, C, C++, Python, Scala, MATLAB, Bash, SQL, HiveQL, HTML, CSS, L<sup>A</sup>T<sub>E</sub>X, Go(Limited), JavaScript(Limited)
- **Platform:** Mac OS, Windows, Linux
- **Tools:** Perf, GDB, Valgrind, Make, Git, Vim, Neo4j, Docker
- **Data:** Oracle, MySQL, SQLite3, Hadoop, Hive, Spark, Flink

## 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  
Phone: 415-813-9364 E-mail: palvaro@ucsc.edu

**Chris Parsa** University of California, Santa Cruz  
Adjunct lecturer of Computer Engineering  
Phone: 831-252-9033 E-mail: cparsa@ucsc.edu