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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 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. 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

WORK
EXPERIENCE

Software Engineer Intern, Dropbox

May 2019 - Aug. 2019

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

Software Engineer Intern, Hainan Airline

Jun. 2018 - Aug. 2018

- Worked on Airline Map team to create a new navigation app for pilots
- Implemented newly-designed pages and built interactive navigation with HTML, CSS, XML, and OpenLayers3

PROJECTS

Distributed Debugger Using Provenance Graph

2018

- Implemented a lineage-driven distributed debugger that can analyze the given program and give suggestions to the programmer how and where to correct the program

Fault-tolerant Scalable Key-Value Store

2018

- Built a distributed, fault-tolerant, highly available and eventually consistent key-value store that can store the amount of data that cannot fit into one single machine.

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:** Java, C, C++, Python, Go, Scala, Bash, SQL, HiveQL, HTML, CSS, L^AT_EX, JavaScript(Limited)
- **Platform:** Mac OS, Windows, Linux
- **Tools:** Perf, GDB, Valgrind, Make, Git, Vim, Neo4j, Docker
- **Data:** Oracle, MySQL, Hadoop, Hive, Spark, Flink, ZooKeeper

REFERENCES

- Dr. J.J. Garcia-Luna-Aceves** University of California, Santa Cruz
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Jack Baskin Endowed Chair of Computer Engineering
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- Dr. Peter Alvaro** University of California, Santa Cruz
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- Chris Parsa** University of California, Santa Cruz
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