Meng-Jung (Chloe) Tsai

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Education

University of California, Los Angeles, CA, USA — Jun. 2023 (Expected)
Ph.D. in Computer Science (GPA: 3.78/4.0)
- Advisor: Leonard Kleinrock
- Research Topic: Computer Networks and Systems, Congestion Control, Queueing Disciplines, Queueing Systems

National Chiao Tung University, Hsinchu, Taiwan — Jun. 2018
B.S. in Computer Science (GPA: 3.95/4.0)
- Courses: Network Programming, Hardware-Software Co-Design, Algorithms, Data Structures, Compiler Design

Work Experience

Cisco Meraki, San Francisco, CA, USA — Jun. 2020 – Sep. 2020
Software Engineer Intern @ MX Routing Team
- Automated the fetching process to periodically get the system reports from 50,000 clients' routers in **Scala**
- Built an analysis framework to examine potential bugs causing different routing results between two systems
- Reduced 38% of storage by identifying and removing difference routes due to known bugs from the system report
- Discovered 4 new bugs in the upcoming system with the proposed analysis framework

Research Experience

University of California Los Angeles, CA, USA — Sep. 2018 – Present
Graduate Student Researcher @ Connection Lab
- Probing characteristics of the Power metric for congestion control and testing with **MATLAB** and **Python**
- Exploring the operating point with maximal throughput and minimum delay under different queueing disciplines
- Analyzing **BBR** congestion control algorithms on Google Cloud Platform with **NS3**, **iperf**, and **Mahimahi**
- Developing congestion control algorithms with a focus on the Power metric in Linux kernel's **TCP/IP** stack

Projects

Dropbox like Cloud Drive
- Built an interactive server providing independent cloud storage service for multiple clients in **C** and **C++**
- Increased throughput and QoE with non-blocking socket programming by using **Linux systems call**
- Emulated the events of packet loss and re-ordering with traffic control tool **iproute2** to test the reliability

Acceleration of Full Search Algorithm for Motion Estimation
- Profiled the motion estimation program with **gprof** and real-time timer to find the bottleneck of the program
- Decreased 94% computation time by revising the implementation with consideration of the device architecture in **C**
- Achieved more than 260 times speedup by implementing hardware circuits designs in Verilog on FPGA

Analysis of a Network with Batfish
- Verified the SNMP hosts are reachable from all routers by searching the SNMP flows with reachability constraints
- Changed configuration in the data plane by adding ACL to stop SNMP services in certain ASes
- Detected forwarding loops and fixed it by changing the configurations of community in the control plane

Parallel ASE Algorithm for Data Encryption on GPU
- Decreased 70% of program run time with **Pthread** and **OpenMP** implementation on four-cores CPU
- Achieved additional 4 times speedup compared to Pthread and OpenMP methods by using GPU with **CUDA**
- Compared different parallelization tools in speedup and efficiency increase along with the data input size

Skills

Programming Languages: C/C++, Python, MATLAB, Scala, MySQL, PostgreSQL, R, Java

Technical Skills: Git, NS-3, FPGA, Google Cloud Platform, Jenkins

Awards

The Women Enhancing Technology Qualcomm Global Scholars Program, 2017
- Only 16 female students in Taiwan were awarded $2,500 scholarship and 6-month mentorship

Presidential Award, 2014
- Students within top 5%