Yi Cao

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Research Summary

4+ years research experience in computer networks — TCP congestion control; Linux TCP/IP stack; Web/Video application performance analysis and optimizations.

Education

Stony Brook University   Stony Brook, New York, United States
Ph.D. Candidate, Department of Computer Science   Aug.2014–Present
Advisors: Prof. Aruna Balasubramanian; Prof. Anshul Gandhi

University of Science and Technology of China (USTC)   Hefei, Anhui, P. R. China
Bachelor of Science, School of Mathematical Science   Sep.2010–Jun.2014
Thesis: Global Optimization and its Application to Image Segmentation
Advisor: Prof. Yuhong Dai, Chinese Academy of Sciences

Work Experience

Research Intern – Brave Software   San Francisco, California, United States
Mentor: Dr. Ben Livshits   May.2018–Aug.2018

- Performed performance research on Brave vs other Chromium-based Web browsers.
- Collaborated with the DevOps team to conduct browser automated tests by using Jenkins and AWS Lambda.

Skills

Languages: C/C++, JavaScript, Node.js, Python, Java, Matlab, Ruby, R, LaTeX

Publications

When to use and when not to use BBR: An empirical analysis and evaluation study
Yi Cao, Arpit Jain, Kriti Sharma, Aruna Balasubramanian and Anshul Gandhi
IMC, Amsterdam, Netherlands, October, 2019

ECON: Modeling the network to improve application performance
Yi Cao, Javad Nejati, Aruna Balasubramanian and Anshul Gandhi
IMC, Amsterdam, Netherlands, October, 2019

Rethinking TCP Throughput and Latency Modeling (Poster)
Yi Cao, Aruna Balasubramanian and Anshul Gandhi
SIGCOMM, UCLA, California, August, 2017

Deconstructing the Energy Consumption of the Mobile Page Load
Yi Cao, Javad Nejati, Muhammad Wajahat, Aruna Balasubramanian and Anshul Gandhi
SIGMETRICS, UIUC, Illinois, June 2017

Analyzing the Power Consumption of the Mobile Page Load (Poster)
Yi Cao, Javad Nejati, Pavan Maguluri, Aruna Balasubramanian and Anshul Gandhi
SIGMETRICS, Antibes Juan-les-Pins, France, June 2016

Research Projects

Evaluation and optimization of emerging TCP variants
– Performed empirical analysis on the performance of Google's BBR congestion control algorithm.
– Revealed the root causes of BBR's existing issues.

Modeling the network to improve application performance
– Designed `ECON` — A hybrid (analytical + empirical) network model, with which
  – web clients can choose between HTTP/1.1 and HTTP/2 to reduce page load time.
  – video clients can choose the optimal bitrates for video segments to improve QoE.

Mobile Web energy analysis tool — RECON
– Implemented `RECON` — A quick and accurate power model of mobile page loads, which
  – enables breakdown of the page load energy consumption.
  – reveals how and why certain optimizations affect both the page load time and the energy.

Teaching Assistant

CSE/MAT 373 – Analysis of Algorithms   Sep.2016–Dec.2016
Instructor: Prof. Steven Skiena, Department of Computer Science, Stony Brook University

CSE 101 – Introduction to Computers (Java Programming)   Jan.2015–May.2015
Instructor: Prof. Michael Tashbook, Department of Computer Science, Stony Brook University

CSE 110 – Introduction to Computer Science (Python Programming)   Sep.2014–Dec.2014
Instructor: Prof. Michael Tashbook, Department of Computer Science, Stony Brook University

Awards

SIGCOMM 2017 Travel Grant   Jun.2017
SIGMETRICS 2017 Travel Grant   May.2017
Special CS Department Chair Fellowship at Stony Brook University   Aug.2014
Meritorious Winner — Mathematical Contest in Modeling (COMAP)   Apr.2013
Outstanding Student Scholarship at University of Science and Technology of China   2011–2013

Talks

NENS 2017   Boston University, Massachusetts, Dec.2017
 – Rethinking TCP Throughput and Latency Modeling

SIGCOMM 2017   UCLA, California, Aug.2017
 – Rethinking TCP Throughput and Latency Modeling

SIGMETRICS 2017   UIUC, Illinois, Jun.2017
 – Deconstructing the Energy Consumption of the Mobile Page Load

AT&T Research Academic Summit 2016   Bedminster, New Jersey, Apr.2016
 – Analyzing the Power Consumption of the Mobile Page Load

Professional Services

Reviewer: ACM Computing Surveys