Wen Hu

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Lab of Multimedia and Networking, Tsinghua University

Education

Department of Computer Science, Tsinghua University, Beijing, China
Ph.D. Candidate, Advisor: Prof. Lifeng Sun. *2012–2017*

School of Computer Engineering, Nanyang Technological University, Singapore
Visiting student, Advisor: Prof. Yonggang Wen. *2015–2016*

School of Computer Science and Technology, Xidian University, Xi'an, China
Bachelor, GPA: 94.7/100, ***Rank: 4/478****.* *2008–2012*

Projects

Video Prefetching*, research project.* *2015–2016*

- Algorithm: Online determine how many and which content items should be prefetched with the reinforcement learning algorithm to strike a balance between the increased prefetching/storage cost incurred by incorrect prediction and the reduced content download delay because of successful prediction (C/C++).
- Results: 70% cost saving with a high precision and hit ratio (80%).

Overlay Path Construction*, research project.* *2014–2015*

- Algorithm: Select WebRTC-powered browsers by taking the failure randomness and clients' diversity into account to relay the failed web requests (C/C++ & Javascript).
- Results: 60% successful download ratio improvement in the case of regional CDN server outage.

Wi-Fi AP Organization*, research project.* *2014–2015*

- Algorithm: Partition APs into Voronoi-like cells to balance the trade-off between the increased replication costs and the improved QoE, and replicate content ahead of users' requests to offload peak traffic (C/C++ & Python).
- Results: 27% server load reduction and 40% quality of experience improvement.

RTT Prediction*, research project.* *2013–2014*

- Algorithm: Predict RTT with a hybrid learning- and model-based prediction approach: for larger geographical distance, predict RTT by training a decision tree; for shorter distance, predict RTT by composing the network path (C/C++).
- Results: 90% of the predictions error are less than 10 ms.

TCP Optimization*, research project.* *2013–2014*

- Algorithm: Increase the initial CWND window size to reduce the delivery time and utilize virtual multi-connections to improve the network utilization (C/C++).
- Results: 5% improvement under the Tencent telecommunication environment.

Research Interests

Data-driven Multimedia Content Delivery

- Edge-assisted content delivery.
- Overlay path construction.
- CDN server selection.

Publications

[1]**Wen Hu**, Zhi Wang, and Lifeng Sun. Towards network-failure-tolerant web content delivery: A path-aware peer-assisted approach. In *IEEE GLOBECOM*, 2016.

[2]**Wen Hu**, Zhi Wang, and Lifeng Sun. Characterizing tcp performance for chunk delivery in dash. In *PCM*, 2016.

[3]**Wen Hu**, Zhi Wang, and Lifeng Sun. Guyot: a hybrid learning- and model-based rtt predictive approach. In *IEEE ICC*, 2015.

[4]**Wen Hu**, Zhi Wang, and Lifeng Sun. Path-aware peer-assisted web content delivery against network failures. In *IEEE/ACM IWQoS*, 2015.

[5]**Wen Hu**, Zhi Wang, Ming Ma, and Lifeng Sun. Edge video cdn: A wi-fi content hotspot solution. *(submitted to JCST)*.

[6]**Wen Hu**, Yichao Jin, Yonggang Wen, Zhi Wang, and Lifeng Sun. Towards wi-fi ap-assisted content prefetching for on-demand tv series: A learning-based approach. *(submitted to TCSVT)*.

[7]**Wen Hu**, Zhi Wang, and Lifeng Sun. Towards reliable web content delivery against network failures: A path-aware peer-assisted approach. *(submitted to MTA)*.

Patents

- Zhi Wang, **Wen Hu**, and Lifeng Sun. A Layered RTT Prediction Method, ZL201510293578.5, 2016.
- Zhi Wang, **Wen Hu**, and Lifeng Sun. A Wi-Fi AP based Content Delivery Method, 201510897619.1, 2016.

Selected Honors

- First Class Guanghua Scholarship, Tsinghua University, 2015.
- Outstanding Graduate Award, Xidian University, 2012 (top 1%).
- National Scholarship, Xidian University, 2009, 2011 (top 1%).
- Third Prize in the National Undergraduate Electronic Design Contest, 2011.
- Third Prize in the National English Competition for College Students, 2011.
- First Prize in the Programming Contest, Xidian University, 2010 (top 5%).

Languages and Skills

- Embedded system, Linux DE, Windows DE.
- C/C++, Shell script, Python, Matlab.
- Latex, Office software.