Shuihai Hu

Contact Information

Personal Email: hushccgg@gmail.com   Huawei Shenzhen Base, Shenzhen, China

Education

Hong Kong University of Science and Technology (HKUST)   Hong Kong, China
Ph.D. in Computer Science and Engineering   *Aug. 2013 - June 2019*
Advisor: Prof. Kai Chen

University of Science and Technology of China (USTC)   Hefei, China
B.S. in Computer Science and Technology   *Sept. 2009 - June 2013*

Research Interest

I am broadly interested in computer networking, with special focuses on real-time media communication, data center networking, RDMA networks, and AI-based networking solutions. I also worked on distributed AI systems and federated learning systems.

Work Experiences

- **Huawei**, Shenzhen, China
  Principal Research Engineer   7/2021 - present
- **Clustar**, Shenzhen, China
  Chief Scientist   7/2019 - 6/2021

Pre-graduation Industrial Experiences

- **Huawei**, Shenzhen, China
  Intern, Cloud Networking Lab   11/2017 - 1/2018
- **Microsoft Research Asia**, Beijing, China
  Research Intern, Cloud and Mobile Group   10/2016 - 1/2017
- **Microsoft Research Asia**, Beijing, China
  Research Intern, Wireless and Networking Group   9/2015 - 1/2016

Publications

Conference:

- **Shuihai Hu**, Wei Bai, Gaoxiong Zeng, Zilong Wang, Baochen Qiao, Kai Chen, Kun Tan, Yi Wang, "Aeolus: A Building Block for Proactive Transport in Datacenters", **SIGCOMM**, 2020.
- Wei Bai, **Shuihai Hu**, Kai Chen, Kun Tan, Yongqiang Xiong, "One More Config is Enough: Saving (DC)TCP for High-speed Extremely Shallow-buffered Datacenters", **INFOCOM**, 2020.
- Zhuotao Liu, Kai Chen, Haitao Wu, **Shuihai Hu**, Yih-Chun Hu, Yi Wang, Gong Zhang, "Enabling Work-conserving Bandwidth Guarantees for Multi-tenant Datacenters via Dynamic Tenant-Queue Binding", **INFOCOM**, 2018.
- **Shuihai Hu**, Yibo Zhu, Peng Cheng, Chuanxiong Guo, Kun Tan, Jitendra Padhye, Kai Chen, "Tagger: Practical PFC Deadlock Prevention in Data Center Networks", **CoNEXT**, 2017.
- **Shuihai Hu**, Wei Bai, Kai Chen, Chen Tian, Ying Zhang, Haitao Wu, "Providing Bandwidth Guarantees, Work Conservation and Low Latency Simultaneously in the Cloud", **INFOCOM**, 2016.
- **Shuihai Hu**, Kai Chen, Haitao Wu, Wei Bai, Chang Lan, Hao Wang, Hongze Zhao, Chuanxiong Guo, "Explicit Path Control in Commodity Data Centers: Design and Applications", **NSDI**, 2015.

Journal:

- **Shuihai Hu**, Wei Bai, Gaoxiong Zeng, Zilong Wang, Baochen Qiao, Kai Chen, Kun Tan, Yi Wang, "Aeolus: A Building Block for Proactive Transport in Datacenters", **IEEE/ACM Transactions on Networking**, 2021.
- Wei Bai, **Shuihai Hu**, Kai Chen, Kun Tan, Yongqiang Xiong, "One More Config is Enough: Saving (DC)TCP for High-speed Extremely Shallow-buffered Datacenters", **IEEE/ACM Transactions on Networking**, 2020.
- **Shuihai Hu**, Yibo Zhu, Peng Cheng, Chuanxiong Guo, Kun Tan, Jitendra Padhye, Kai Chen, "Tagger: Practical PFC Deadlock Prevention in Data Center Networks", **IEEE/ACM Transactions on Networking**, 2019.
- **Shuihai Hu**, Wei Bai, Kai Chen, Chen Tian, Ying Zhang, Haitao Wu, "Providing Bandwidth Guarantees, Work Conservation and Low Latency Simultaneously in the Cloud", **IEEE Transactions on Cloud Computing**, 2019.

○ **Shuihai Hu**, Kai Chen, Haitao Wu, Wei Bai, Chang Lan, Hao Wang, Hongze Zhao, Chuanxiong Guo, "Explicit Path Control in Commodity Data Centers: Design and Applications", **IEEE/ACM Transactions on Networking**, 2016.

Workshop:

○ Xinchen Wan, Hong Zhang, **Shuihai Hu**, Junxue Zhang, Kai Chen, "RAT - Resilient Allreduce Tree for Distributed Machine Learning", **APNet**, 2020.

○ Zhaoxiong Yang, **Shuihai Hu**, Kai Chen, " FPGA-Based Hardware Accelerator of Homomorphic Encryption for Efficient Federated Learning", **FL-IJCAI**, 2020.

○ **Shuihai Hu**, Wei Bai, Baochen Qiao, Kai Chen, Kun Tan, "Augmenting Proactive Congestion Control with Aeolus", **APNet**, 2018.

○ Wei Bai, Kai Chen, **Shuihai Hu**, Kun Tan, Yongqiang Xiong, "Congestion Control for High-speed Extremely Shallow-buffered Datacenter Networks", **APNet**, 2017.

○ **Shuihai Hu**, Yibo Zhu, Peng Cheng, Chuanxiong Guo, Kun Tan, Jitendra Padhye, Kai Chen, "Deadlocks in Datacenter Networks: Why Do They Form, and How To Avoid Them", **HotNets**, 2016.

○ Li Chen, **Shuihai Hu**, Kai Chen, Haitao Wu, Danny H. K. Tsang, "MCP: Towards Minimal Delay Deadline-Driven Datacenter Transport" **HotNets**, 2013.

Poster:

○ **Shuihai Hu**, Kai Chen, Gaoxiong Zeng, "Improved Path Compression for Explicit Path Control in Production Data Centers", **NSDI**, 2016.

Teaching Experience

Teaching Assistant, HKUST COMP 4621: Computer Communication Networks I	*2016 Spring*
Teaching Assistant, HKUST COMP 2021: Unix and Script Programming	*2015 Spring*
Teaching Assistant, HKUST COMP 3511: Operating Systems	*2014 Fall*
Teaching Assistant, HKUST COMP 2611: Computer Organization	*2014 Spring*

Awards and Honors

HKTIIT Postgraduate Excellence Scholarships	*2017*
HKUST Research Travel Grant	*2015-2017*
USENIX NSDI Student Grant	*2015*
HKUST Postgraduate Scholarship	*2013 - 2017*
USTC First-Class Outstanding Student Scholarship (Top 5%)	*2012*
CASTC Second-Class Outstanding Student Scholarship (Top 15%)	*2011*

Selected Talks

○ Aeolus: A Building Block for Proactive Transport in Datacenters.
SIGCOMM 2020, Virtual Conference   August 2020

○ Tagger: Practical PFC Deadlock Prevention in Data Center Networks.
CoNEXT 2017, Seoul/Incheon, South Korea   December 2017

○ Congestion Control for High-speed Extremely Shallow-buffered Datacenter Networks.
APNet 2017, Hong Kong, China   August 2017

○ Deadlocks in Datacenter Networks: Why Do They Form, and How To Avoid Them.
HotNets 2016, Atlanta, Georgia, USA   November 2016

○ Providing Bandwidth Guarantees, Work Conservation and Low Latency Simultaneously in the Cloud.
INFOCOM 2016, San Francisco, CA, USA   April 2016

Professional Activities

○ IEEE Transactions on Parallel and Distributed Systems (TPDS). Reviewer, 2019.

○ IEEE/ACM Transactions on Networking (ToN), Reviewer, 2018

○ IEEE Transactions on Communications (TCOM), Reviewer, 2017

○ The Computer Journal (COMPJ), Reviewer, 2016