

Education

- Institute of Computing Technology, Chinese Academy of Sciences**, Beijing, China 09/2014 – 06/2017
Master of Engineering, Computer Science
GPA: **87.90/100.00**, Advised by Prof. Mingyu Chen
Master thesis: [An Application-driven Flow Scheduling in Data Centers](#) (in Chinese)
- Huazhong University of Science and Technology**, Wuhan, China 09/2010 – 06/2014
Bachelor of Engineering, Computer Science
GPA: **87.66/100**; Ranking: **7/320**

Publications

1. **Zhuang Wang**, Ke Liu, Long Li, Weiyi Chen, Mingyu Chen, Lixin zhang, “[A Novel Approach for All-to-All Routing in All-optical Hypersquare Torus Network](#),” in *Proc. of ACM International Conference on Computing Frontiers (CF)*, 2016.
2. Ke Liu, **Zhuang Wang**, Jack Y. B. Lee, Mingyu Chen, Lixin Zhang, “[Adaptive Rate Control over Mobile Data Networks with Heuristic Rate Compensations](#),” in *Proc. of IEEE/ACM International Symposium on Quality of Service (IWQoS)*, 2016.
3. **Zhuang Wang**, Ke Liu, Yifan Shen, Jack Y. B. Lee, Mingyu Chen, Lixin Zhang, “[Intra-host Rate Control with Centralized Approach](#),” in *Proc. of IEEE Cluster* 2016.
4. **Zhuang Wang**, Weifa Liang, Meitian Huang, Yu Ma, “[Delay-Energy Joint Optimization for Task Offloading in Mobile Edge Computing](#),” in CoRRabs/1804.10416 (2018)

Awards and Honors

Award	Organization	Date
National Scholarship	Ministry of Education of P. R. China	2011
National Encouragement Scholarship	Ministry of Education of P. R. China	2013
National Scholarship	Ministry of Education of P. R. China	2016
International Postgraduate Research Scholarship (IPRS)	Australian government	2017

Professional Experiences

- Brown University** 07/2018 – present
Advised by Prof. Theophilus Benson
 - Performance diagnosis in microservices architecture
- Australian National University**, Canberra, Australia 08/2017 – 05/2018
Research Assistant, Advised by Prof. Weifa Liang
 - Task offloading in Mobile Edge Computing
- Institute of Computing Technology, Chinese Academy of Sciences**, Beijing, China 01/2014 – 05/2014
Advised by Prof. Binzhang Fu
 - Congestion Prediction in Network on Chips

Selected Projects

Haiyun, a labeled network system

Haiyun is a novel network system with the support of hardware and software to significantly reduce the long tail delay in data centers. This project customizes NICs to enable them to distinguish packets with different service-level agreements (SLAs) and label them with different priorities. With the support of DPDK and mTCP, Haiyun could keep packets with different SLAs from interfering with each other from NICs to applications.

My work consists of two components. One is a flow generator, which could generate more than 1 million concurrent TCP connections with just one physical server. The other is a third-party tool to measure the performance of Haiyun. To measure the delay resulted from packets processing in servers, we use switches' port mirroring function to monitor packets and measure their delays on a specific server. To reduce the overheads of operating system, we leverage DPDK to bypass the kernel to optimize the performance of this tool.

Panda, a flow scheduling in data centers

Panda can bound low latency for delay-sensitive applications and optimize the flow complete times for throughput-intensive applications on the premise that flow information is not known *a priori*. We observe that most packets generated by delay-sensitive applications are small, while by throughput-intensive applications are large. Panda takes advantage of the distinct flow size distributions to differentiate the two kinds of applications.

At its heart, Panda derives an optimal threshold to divide packets into two categories: large and small, ensuring that small packets dominate traffic from delay-sensitive applications and large ones dominate traffic from throughput-intensive applications. In addition, Panda allocates each flow a counter which is initiated with zero. Large packets increase the counter while small packets decrease it. Then Panda assigns priorities to flows according to their counters.