Zhang **Xiao**

(+86) 152-0192-0081 | zx15201920081@gmail.com | timez-zx.github.io | Timez-zx

About me

I am a master student in Shanghai Jiao Tong University advised by Prof. **Shizhen Zhao** and also work together with Prof. **Vincent Liu** now. My research interests focus on networked systems. I am also interested in programmable devices like FPGA. I am fascinated by the combination of theory and practice in networked systems and the creative potential of programmable devices.

Education

Shanghai Jiao Tong University — *Shanghai, China*
M.E. in Communication Engineering, GPA: 3.76/4.0 — *Sept. 2021 - Present*

Shanghai Jiao Tong University — *Shanghai, China*
B.E. in Information Engineering, GPA: 3.81/4.3 — *Sept. 2017 - June. 2021*
- Thesis title: Design of Robust and Efficient Edge Server Placement and Server Scheduling Policies

Research Experience

University of Pennsylvania, advised by Prof. Vincent Liu — *Philadelphia, USA*
Visiting Student — *July. 2023 - Present*
- *Beaver*: Enabling Practical Distributed Snapshots Exploiting Software Load Balancers.

Shanghai Jiao Tong University, advised by Prof. Shizhen Zhao — *Shanghai, China*
Master Student — *Sep. 2021 - July. 2023*
- *Flattened Clos Plus (FC+)*: Near-optimal topology-routing co-design free of deadlocks for RoCE-based expander networks.
- *Flattened Clos (FC)*: Deadlock-free topology-routing co-design for RoCE-based expander networks.
- *Time Synchronization for Edge Devices*: High-precision time synchronization design for edge devices.

Shanghai Jiao Tong University, advised by Prof. Shizhen Zhao — *Shanghai, China*
Undergraduate Student — *March. 2020 - Feb. 2021*
- Design of Robust and Efficient Edge Server Placement and Server Scheduling Policies.

Publication & Insubmission

Publication

- **Xiao Zhang**, Peirui Cao, Yongxi Lyu, Qizhou Zhang, Shizhen Zhao, Xinbing Wang, Chenghu Zhou "FC+: Near-optimal Deadlock-free Expander Data Center Networks", Wuhan, China, December, 2023. ISPA
- Shizhen Zhao*, Qizhou Zhang*, Peirui Cao, **Xiao Zhang**, Xinbing Wang, Chenghu Zhou, "Flattened Clos: Designing High-performance Deadlock-free Expander Data Center Networks Using Graph Contraction" in Boston, MA, USA (2023). NSDI
- Shizhen Zhao*, **Xiao Zhang***, Peirui Cao, Xinbing Wang, "Design of Robust and Efficient Edge Server Placement and Server Scheduling Policies" Virtual Event (2021). IWQOS

Insubmission

- Liangcheng Yu, **Xiao Zhang**, Haoran Zhang, John Sonchack, Dan Ports, Vincent Liu, "Beaver: Enabling Practical Distributed Snapshots Exploiting Software Load Balancers"

Projects

FPGA

- **Earliest Deadline Fist (EDF) switch**: A special case of PIFO (Push-in First-out) switch (packets with the earliest deadline are transmitted first). Implemented it with heap and deployed it on ZYNQ7000, which has worked in my office for over 2 years. [picture, code]

- **Low latency transmission**: Deployed Riffa on ZC706 to achieve sub-microsecond level low latency.
- **64-FFT acceleration**: Used lookup table to accelerate 64-FFT algorithm.

System

- **Beaver's Benchmark**: Implemented testbed with L4 load balancers. Used DPDK and eBPF for high-performance NAT and SNAT. Benchmarked Beaver on the testbed with 32 hosts.
- **Concurrent Map Reduce System**: Realized map reduce system using multiple threads.
- **Concurrent web server**: Implemented high-performance web server using multiple threads.

Honors & Awards

2021	**Awardee**, Outstanding Graduate of Shanghai	*Shanghai, China*
2020	**Awardee**, Liu Yongling Scholarship	*Shanghai, China*
2018-20	**Awardee**, Category B Academic Scholarship	*Shanghai, China*

Skills

Programming	C/C++, Python, Verilog, VHDL, Matlab
Tools	eBPF, DPDK, FPGA, Network Simulator 3 (NS-3)
Languages	English, Chinese