Yang Zhou

Curriculum Vitae

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Education

Ph.D. **Computer Science, Harvard University**, *Cambridge, MA, USA*, 2018–Present.
Advisor: Professor Minlan Yu and James Mickens

M.S. **Computer Science, Harvard University**, *Cambridge, MA, USA*, 2018–2021.

B.S. **Computer Science, Peking University**, *Bejing, China*, 2014–2018.
Advisor: Professor Tong Yang

Selected Publications

2023 **Yang Zhou**, Zezhou Wang, Sowmya Dharanipragada, and Minlan Yu. Electrode: Accelerating Distributed Protocols with eBPF. NSDI 2023.

2022 **Yang Zhou**, Ying Zhang, Minlan Yu, Guangyu Wang, Dexter Cao, Eric Sung, and Starsky Wong. Evolvable Network Telemetry at Facebook. NSDI 2022.

2022 **Yang Zhou**, Hassan Wassel, Sihang Liu, Jiaqi Gao, James Mickens, Minlan Yu, Chris Kennelly, Paul Turner, David Culler, Hank Levy, and Amin Vahdat. Carbink: Fault-Tolerant Far Memory. OSDI 2022.

2022 **Yang Zhou**, Varun Gandhi, Mark Wilkening, James Mickens, and Minlan Yu. NFShield: Securing NIC-Accelerated Network Functions in the Cloud. In submission.

2018 Tong Yang, Jie Jiang, Peng Liu, Qun Huang, Junzhi Gong, **Yang Zhou**, Rui Miao, Xiaoming Li, and Steve Uhlig. Elastic Sketch: Adaptive and Fast Network-Wide Measurements. SIGCOMM 2018.

2018 **Yang Zhou**, Tong Yang, Jie Jiang, Bin Cui, Minlan Yu, Xiaoming Li, and Steve Uhlig. Cold Filter: A Meta-Framework for Faster and More Accurate Stream Processing. SIGMOD 2018.

2018 **Yang Zhou**, Omid Alipourfard, Minlan Yu, and Tong Yang. Accelerating Network Measurement in Software. SIGCOMM CCR 2018.

2018 Omid Alipourfard, Masoud Moshref, **Yang Zhou**, Tong Yang, and Minlan Yu. A Comparison of Performance and Accuracy of Measurement Algorithms in Software. ACM Symposium on SDN Research (SOSR) 2018.

2017 Tong Yang, **Yang Zhou**, Hao Jin, Shigang Chen, and Xiaoming Li. Pyramid Sketch: A Sketch Framework for Frequency Estimation of Data Streams. VLDB 2017.

Work Experience

09/2021–05/2023 **Student Researcher**, *Google*, CA, Mentor: Hank Levy and Hassan Wassel.

- Continue working on the fault-tolerant remote memory.
- Work on the fault tolerance of resource-disaggregated computations.
- Work on the efficient scheduling of microsecond tasks.

06/2021–09/2021 **Research Intern**, *Google*, CA, Mentor: Hank Levy and Hassan Wassel.

- Work on fault tolerance for application-integrated far memory system.
- Propose a span-based erasure coding scheme to encode different sizes of objects.
- Design a RMA-based data-parity consistency protocol for swapping out spans.

07/2020–09/2020 **Research Intern**, *VMware Research*, CA, Mentor: Israel Cidon and Christos Karamanolis.

- Accelerate geo-distributed data analytics and save WAN traffic cost, by applying traffic redundancy elimination (TRE) technique to data analytics jobs.
- Hack Alluxio, an in-memory data cache platform, to enable TRE when sending data across different data centers.

11/2019–05/2020 **Research Collaborator**, *Facebook*, CA, Mentor: Ying Zhang.

- Work on Facebook change-aware network telemetry system.
- Layering design along the data collection pipeline to tolerate changes.
- Incorporate cross-layer dependency in monitoring system to help troubleshooting.

03/2018–05/2018 **System Operation and Maintenance Intern**, *SenseTime*, Beijing.

- Wrok on Ceph setup, testing, maintenance, monitoring, and alerting.

Research Experience

Harvard University

10/2018–09/2019 **Securing NIC-accelerated network functions in the Cloud**.

- Build SGX-like TEEs for NFs in SmartNICs under multi-tenant cloud environment.
- Pervasively virtualize hardware accelerators (similar to SR-IOV); Enforce single-owner semantics for on-NIC RAM and caches; Provide dedicated bus bandwidth for each network function.

Yale University (interned at Minlan's group)

06/2017–01/2018 **NF chain performance diagnosis; network measurement acceleration**.

Peking University

04/2016–03/2017 **Improving the accuracy and speed of approximate data stream processing**.

Services

2023 **TPC member**, SIGCOMM Poster/Demo.

2020 **TPC member**, Infocom workshop on networking algorithms.

Teaching Experience

Spring 2021 **TA for CS145 Networking at Scale**, *Harvard University, MA*.
Professor Minlan Yu

Fall 2018 **TA for Algorithm Design and Analysis**, *Peking University, Beijing*.
Professor Tong Yang

Highlighted course project

03/2019–05/2019 **Direct message passing in serverless platform**, Harvard CS260r.

- Add the feature of direct message passing to opensource serverless platform – OpenWhisk
- Use docker overlay network for socket connection; Implement a zero-overhead DNS service among serverless containers. Report and code

Awards & Honors

2023 USENIX Student Grant, NSDI'23

2022 Google Ph.D. Fellowship in Systems and Networking

2022 Finalist, Meta/Facebook Ph.D. Fellowship in Networking

2022 USENIX Student Grant, OSDI'22
2022 USENIX Student Grant, NSDI'22
2019 USENIX Student Grant, NSDI'19
2018 Top Ten undergraduate Dissertation Award of PKU EECS (10/327)
2018 New Academic Star Award of EECS (1/193), Peking University
2017 Arawana Scholarship (2/193), Peking University
2017 Exceptional Award for Academic Innovation (2/193), Peking University
2017 Merit Student Honor, Peking University
2017 Honorable Mention in Mathematical Contest in Modelling
2016, 2017 Peking University ACM/ICPC Third Prize, Peking University
2016 Pinyou Hudong Scholarship, Peking University
2015 Peking University ACM Summer School First Prize, Peking University
2015 May Fourth Scholarship, Peking University
2015 Academic Improvement Honor, Peking University

Skills

Tools DPDK, SmartNIC (FPGA, multi-core), SGX enclave, gem5, docker
Languages C, C++, Vivado HLS, Verilog, Python, Java, Rust, Scala, C#, SQL

Students Mentored

Yunxi Shen Tsinghua University undergrad, on resource-efficient cluster management/job scheduling
Matt Kiley Harvard College undergrad, on accelerating transaction processing using eBPF
Xingyu Xiang Peking University undergrad, on accelerating transaction processing using eBPF
Zezhou Wang Peking University undergrad → University of Washington PhD, on Electrode [NSDI'23]

Talks

April 21, 2023 **Electrode: Accelerating Distributed Protocols with eBPF**, ACE Center for Evolvable Computing, Virtual.
April 19, 2023 **Electrode: Accelerating Distributed Protocols with eBPF**, NSDI, Boston, MA.
April 14, 2023 **Electrode: Accelerating Distributed Protocols with eBPF**, Duke University systems and networking seminar, Virtual.
April 11, 2023 **Electrode: Accelerating Distributed Protocols with eBPF**, Google, Virtual.
Mar 27, 2023 **Electrode: Accelerating Distributed Protocols with eBPF**, Columbia University system lunch, Virtual.
Nov 17, 2022 **Carbink: Fault-Tolerant Far Memory**, WORDS Workshop, San Diego, CA.
July 11, 2022 **Carbink: Fault-Tolerant Far Memory**, OSDI, Carlsbad, CA.
July 1, 2022 **Carbink: Fault-Tolerant Far Memory**, Microsoft Research Redmond, WA.
June 28, 2022 **Carbink: Fault-Tolerant Far Memory**, Google, Virtual.
April 6, 2022 **Evolvable Network Telemetry at Facebook**, NSDI, Seattle, WA.
Mar 24, 2022 **Carbink: Fault-Tolerant Far Memory**, Google, Virtual.
Mar 31, 2022 **Evolvable Network Telemetry at Facebook**, Boston University, Boston, MA.
Mar 16, 2022 **Evolvable Network Telemetry at Facebook**, Meta, Virtual.