Shuai Mu

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Professional Experience

Stony Brook University, Computer Science Department — Stony Brook, NY

2018/12 - Present Assistant Professor

New York University, Courant Institute — New York, NY

2017/08 - 2018/08 Assistant Professor / Faculty Fellow (Lecturer)

2015/08 - 2017/08 Post-Doctoral Associate
Advisor: Michael Walfish

New York University, Courant Institute — New York, NY

2013/09 - 2015/08 Visiting Scholar
Advisor: Jinyang Li, Wyatt Lloyd (Facebook & USC)

Education

Tsinghua University — Beijing, China

2010/09 - 2015/06 Ph.D. in Computer Science
Advisor: Weimin Zheng, Yongwei Wu, Kang Chen
Thesis: Extracting More Concurrency from Distributed Transactions
Best thesis award in Tsinghua

China Agricultural University — Beijing, China

2006/09 - 2010/06 B.S. in Computer Science

Conference TPC Member

2025 EuroSys

2024 SOSP, USENIX ATC

2023 NSDI, ICDCS, SIGCOMM

2022 ASPLOS (ERC)

2021 NSDI

2020 USENIX ATC

Workshop TPC Member

2024 FAB (joint with VLDB)
2023 PaPoC (joint with EuroSys)
2021 ApSys
2020 ApSys
2019 ApSys

Journal Referee

2021 TPDS
2020 TPDS, Distributed Computing
2019 CACM
2018 TPDS

Proposal Panelist

2024 SUNY OVPR
2020 NSF CNS Smal

Advisees

Current

2023/08-Present Zihao Zhang (Postdoc)
2020/08-Present Weihai Shen (PhD)
2022/08-Present Santa Shithil (PhD)
2022/08-Present Ze Tang (PhD)
2023/05-Present Kumar Shivam (PhD)
2023/10-Present Ti Zhou (PhD)
2023/09-Present Sethu Ram Kumar Karthikeyan (MS)
2024/01-Present Chenyu Wang (MS)
2024/01-Present Saumitra Bose (MS)

Past

2023/09-2024/05 Ray Zhang (MS)

2023/01-2024/05 Ayush Jain (MS, first job: Oracle)

2023/01-2023/12 Devika Sudheer (MS)

2023/01-2023/12 Nilesh Gajwani (MS)

2023/01-2023/12 Radhika Agarwal (MS, first job: Apple)

2019/06-2020/06 Mrityunjay Kumar (MS, first job: VMWare)

2020/01-2020/12 Ritesh Sinha (MS, first job: HP)

2020/01-2020/12 Satya Jain (MS, first job: VMWare)

2020/01-2021/06 Yida Wu (MS Thesis, first job: Cloudera)

2020/01-2021/06 Ansh Khanna (MS, first job: Google)

Thesis Committee

PhD

2024 Haoran Zhang, University of Pennsylvania

2021 Dejun Teng, Stony Brook University

Master

2022 Kumar Shivam, Stony Brook University

2021 Andrew Yoo, University of Illinois Urbana-Champaign

2021 Yida Wu, Stony Brook University

Department Services

PhD/MS admission committee (2019–2024)

Mentor for CSIRE high school students program (2021-2024)

Mentor for SBU-BNL undergrad summer internship program (2021)

Session Chairs

2023/09 ACM SIGCOMM '23, "Caching and Provisioning"

2021/04 USENIX NSDI '21, "Distributed Systems"

2020/07 USENIX ATC '20, "The WAN One"

Publications

Underlined authors are my advisees at Stony Brook. Waved-underlined authors are other students at Stony Brook.

[1] Haonan Lu, Shuai Mu, Wyatt Lloyd, and Siddhartha Sen. NCC: Natural concurrency control for strictly serializable datastores by avoiding the timestamp-inversion pitfall. In *Proceedings of USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, July 2023.

[2] Jian Zhang, Ye Ji, Shuai Mu, and Cheng Tan. Viper: A fast snapshot isolation checker. In *Proceedings of ACM European Conference on Computer Systems (EuroSys)*, May 2023.

[3] Mohammadreza Alimadadi, Shenghsun Cho , Michael Ferdman, Peter Milder, and Shuai Mu. Waverunner: An elegant approach to hardware acceleration of state machine replication. In *Proceedings of USENIX Conference on Networked Systems Design and Implementation (NSDI)*, April 2023.

[4] Xuhao Luo, Weihai Shen, Shuai Mu, and Tianyin Xu. DepFast: Orchestrating code of quorum systems. In *Proceedings of USENIX Conference on Annual Technical Conference (ATC)*, July 2022.

[5] Weihai Shen, Ansh Khanna, Sebastian Angel, Siddhartha Sen, and Shuai Mu. Rolis: a software approach to efficiently replicating multi-core transactions. In *Proceedings of ACM European Conference on Computer Systems (EuroSys)*, April 2022.

[6] Andrew Yoo, Yuanli Wang, Ritesh Sinha, Shuai Mu, and Tianyin Xu. Fail-slow fault tolerance needs programming support. In *Proceedings of USENIX Workshop on Hot Topics in Operating Systems (HotOS)*, June 2021.

[7] Siyuan Zhou and Shuai Mu. Fault-tolerant replication with pull-based consensus in MongoDB. In *Proceedings of USENIX Conference on Networked Systems Design and Implementation (NSDI)*, February 2021.

[8] Cheng Tan, Changgeng Zhao, Shuai Mu, and Michael Walfish. Cobra: Making transactional key-value stores verifiably serializable. In *Proceedings of USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, November 2020.

[9] Zhaoguo Wang, Changgeng Zhao, Shuai Mu, Haibo Chen, and Jinyang Li. On the parallels between Paxos and Raft, and how to port optimizations. In *Proceedings of ACM Symposium on Principles of Distributed Computing (PODC)*, July 2019.

[10] Shuai Mu, Sebastian Angel, and Dennis Shasha. Deferred runtime pipelining for contentious multicore software transactions. In *Proceedings of ACM European Conference on Computer Systems (EuroSys)*, March 2019.

[11] Yu Lin Chen, Shuai Mu, Jinyang Li, Cheng Huang, Jin Li, Aaron Ogus, and Douglas Phillips. Giza: Erasure coding objects across global data centers. In *Proceedings of USENIX Conference on Annual Technical Conference (ATC)*, July 2017.

[12] Haonan Lu, Christopher Hodsdon, Khiem Ngo, Shuai Mu, and Wyatt Lloyd. The SNOW theorem and latency-optimal read-only transactions. In *Proceedings of USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, November 2016.

[13] Shuai Mu, Lamont Nelson, Wyatt Lloyd, and Jinyang Li. Consolidating concurrency control and consensus for commits under conflicts. In *Proceedings of USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, November 2016.

[14] Zhaoguo Wang, Shuai Mu, Yang Cui, Han Yi, Haibo Chen, and Jinyang Li. Scaling multicore databases via constrained parallel execution. In *Proceedings of ACM International Conference on Management of Data (SIGMOD)*, June 2016.

[15] Shuai Mu, Yang Cui, Yang Zhang, Wyatt Lloyd, and Jinyang Li. Extracting more concurrency from distributed transactions. In *Proceedings of USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, October 2014.

[16] Shuai Mu, Kang Chen, Yongwei Wu, and Weimin Zheng. When Paxos meets erasure code: reduce network and storage cost in state machine replication. In *Proceedings of ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC)*, June 2014.

[17] Shuai Mu, Kang Chen, Pin Gao, Feng Ye, Yongwei Wu, and Weimin Zheng. μLibCloud: Providing high available and uniform accessing to multiple cloud storages. In *Proceedings of ACM/IEEE International Conference on Grid Computing (Grid)*, May 2012.

Unpublished Manuscripts

[1] Santa Shithil, Anshul Gandhi, Erez Zadok, and Shuai Mu. Hybrid consistency made fast and egalitarian. In *Work in Progress*, June 2024.

[2] Ze Tang, Weihai Shen, and Shuai Mu. Consensus made fast. In *Work in Progress*, June 2024.

[3] Zihao Zhang, Ti Zhou, Omar Chowdhury, and Shuai Mu. Automation in formally verifying distributed systems. In *Work in Progress*, June 2024.

[4] Haoran Zhang, Shuai Mu, Sebastian Angel, and Vincent Liu. CausalMesh: A causal cache for stateful serverless computing. In *Submission to PVLDB '24*, May 2024.

[5] Weihai Shen, Yang Cui, Sebastian Angel, Siddhartha Sen, and Shuai Mu. Warbler: Distributed multi-core transactions with geo-replication. In *Submission to SOSP '24*, April 2024.

Conference Talks

[1] Fail-slow fault tolerance needs programming support. In *Proceedings of USENIX Workshop on Hot Topics in Operating Systems (HotOS)*, June 2021.

[2] Consolidating concurrency control and consensus for commits under conflicts. In *Proceedings of USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, October 2016.

[3] Extracting more concurrency from distributed transactions. In *Proceedings of USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, October 2014.

[4] When Paxos meets erasure code: reduce network and storage cost in state machine replication. In *Proceedings of ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC)*, June 2014.

[5] μLibCloud: Providing high available and uniform accessing to multiple cloud storages. In *Proceedings of ACM/IEEE International Conference on Grid Computing (Grid)*, May 2012.

Grants

[1] Collaborative Research: CISE: Large: Systems Support for Run-Anywhere Serverless (2321725)
Amount: $5,000,000. Funding source: NSF.
Start date: 10/1/2023. End date: 9/30/2028.
Princeton Co-PIs: Wyatt Lloyd (PI), Amit Levy.
UPenn Co-PIs: Sebastian Angel, Vincent Liu.
SBU Co-PI: Shuai Mu, $833,186.
UBuffalo Co-PI: Haonan Lu.

[2] CAREER: Rethinking Replication in Highly Available and Reliable Data Stores (2238768).
Amount: $500,206. Funding source: NSF.
Start date: 5/1/2023. End date: 4/30/2028.
Sole PI: Shuai Mu.

[3] Collaborative Research: CNS Core: Large: Systems and Verifiable Metrics for Sustainable Data Centers (2214980).
Amount: $1,500,000. Funding source: NSF.
Start date: 10/01/2022. End date: 09/30/2026.
SBU Co-PIs: Anshul Gandhi (PI), Erez Zadok, Shuai Mu, Dongyoon Lee, Zhenhua Liu, $928,403.
Binghamton Co-PIs: Yu David Liu, Kanad Ghose.
PSU Co-PI: Syed Hussain.

[4] Study of Fail-slow Failures in Distributed Systems
Amount: $15,000. Funding source: Indonesia government.
Start date: 12/1/22. End date: 11/30/23.
Sole PI: Shuai Mu.

[5] Distributed Protocol Offload using FPGA SmartNICs.
Amount: $13,000. Funding source: SUNY OVPR.
Start date: 6/1/22. End date: 8/30/22.
SBU Co-PIs: Shuai Mu (PI), Mike Ferdman, Peter Milder.

[6] Collaborative Research: CNS Core: Small: A new framework for building fail-slow fault-tolerant distributed systems (2130590).
Amount: $500,000, Funding source: NSF.
Start date: 10/01/2021. End date: 09/30/2024.
SBU PI: Shuai Mu, $250,000.
UIUC Co-PI: Tianyin Xu.

Teaching

Distributed Systems, SBU CSE-535	23Fa, 22Fa, 20Fa, 19Fa, 19Sp
Software Engineering, SBU CSE-416	24Sp, 22Sp
Computer System Organization, NYU CSCI-UA.0201	18Sp