Ryan Stutsman

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Research Interests

Large-scale software systems and database systems, low-latency in-memory database systems.

Education

Purdue University	West Lafayette, IN, USA	Computer Science (Honors)	B.S. 2007
Stanford University	Stanford, CA, USA	Computer Science	M.S. 2010
Stanford University	Stanford, CA, USA	Computer Science	Ph.D. 2013

Thesis Title: *Durability and Crash Recovery in Distributed In-Memory Storage Systems*
Advisor: John Ousterhout

Microsoft Research	Redmond, WA, USA	Database Group	Postdoctoral Researcher 2013 - 2015

Professional Experience

2021 –	Associate Professor, School of Computing, University of Utah.
Fall 2021	Scholar in Residence, VMware Research.
2015 – 2021	Assistant Professor, School of Computing, University of Utah.
Summer 2018	Visiting Researcher, Database Group, Microsoft Research.
2013 – 2015	Postdoctoral Researcher, Database Group, Microsoft Research.
Summer 2011	Summer Intern, Memcache Group, Facebook.
Summer 2008	Summer Intern, Lawrence Livermore National Laboratory.
Summer 2007	Summer Intern, Platforms Group, Google.

Honors and Awards

Earned while at the University of Utah

- '22–'23 AY University of Utah Price College of Engineering Outstanding Teaching Award.
- '22–'23 AY University of Utah School of Kahlert Computing Outstanding Teaching Award.
- 2023 VLDB Distinguished Reviewer.
- 2022 USENIX OSDI Jay Lepreau Best Paper Award.
- 2022 HotStorage Intel Best Paper Award.
- 2021 ACM SYSTOR Distinguished Reviewer.
- 2019 Best Paper Runner-Up, ACM SoCC '19.
- 2019 VMware Early Career Faculty Award.
- 2018 NSF CAREER Award.
- 2017 Microsoft Research Redmond Lab Outstanding Research Project Award (joint award).
- 2017 & 2018 SIGMOD Distinguished Program Committee Member.
- '16–'17 AY University of Utah School of Computing Outstanding Teaching Award.
- Dean's teaching commendation letter for Distributed Systems (Fall 2017, Fall 2018, Fall 2020,Fall 2022) Operating Systems (Spring 2018, Spring 2019, Spring 2020, Spring 2021, Spring 2022,Fall 2022) and Computer Networks (Spring 2023) for teaching evaluation ratings in the top 15% in the College.

Earned while at Stanford University

- 2013 Best Student Paper, USENIX ATC '13.
- 2007–2010 Department of Homeland Security Graduate Fellow.

Earned while at Purdue University

- 2007 Purdue University Dept. of Computer Science Outstanding Undergraduate Research Effort.
- 2007 National Science Foundation Graduate Research Fellowship Honorable Mention.
- 2007 Computing Research Assoc. Outstanding Undergraduate Award Honorable Mention.

Publications

Refereed Journal Publications

[1] Al-Mahfoudh, Mohammed S, Ryan Stutsman, and Ganesh Gopalakrishnan. Efficient linearizability checking for actor-based systems. *Software: Practice and Experience*, 53(11):2163–2199, 2023.

Student authors advised by Stutsman are <u>double-underlined</u>.
Other Utah student authors are <u>underlined</u>.

[2] Tao Zhu, Zhuoyue Zhao, Feifei Li, Weining Qian, Aoying Zhou, Dong Xie, Ryan Stutsman, Haining Li, and Huiqi Hu. SolarDB: Toward a Shared-Everything Database on Distributed Log-Structured Storage. *ACM Transactions on Storage*, 15(2):11:1–11:26, June 2019.

[3] John Ousterhout, Arjun Gopalan, Ashish Gupta, Ankita Kejriwal, Collin Lee, Behnam Montazeri, Diego Ongaro, Seo Jin Park, Henry Qin, Mendel Rosenblum, Stephen Rumble, Ryan Stutsman, and Stephen Yang. The RAMCloud Storage System. *ACM Transactions on Computer Systems*, 33(3):7:1–7:55, August 2015.

[4] Christian Grothoff, Krista Grothoff, Ryan Stutsman, Ludmila Alkhutova, and Mikhail J. Atallah. Translation-based Steganography. *Journal of Computer Security*, 17(3):269–303, 2009.

Refereed Conference Publications

Acceptance Rates

[5] Travis Hance, Yi Zhou, Andrea Lattuada, Reto Achermann, Alex Conway, Ryan Stutsman, Gerd Zellweger, Chris Hawblitzel, Jon Howell, and Bryan Parno. Sharding the State Machine: Automated Modular Reasoning for Complex Concurrent Systems. In *17th USENIX Symposium on Operating Systems Design and Implementation, OSDI 2023, July 10-12, 2023*. USENIX Association, 2023. — *20% (50/255)*

[6] Yuhong Zhong, Haoyu Li, Yu Jian Wu, Ioannis Zarkadas, Jeffrey Tao, Evan Mesterhazy, Michael Makris, Junfeng Yang, Amy Tai, Ryan Stutsman, and Asaf Cidon. XRP: In-Kernel Storage Functions with eBPF. In *16th USENIX Symposium on Operating Systems Design and Implementation, OSDI 2022, July 11-13, 2022*. USENIX Association, 2022. **Jay Lepreau Best Paper Award.** — *19% (49/253)*

[7] Ankit Bhardwaj, Chinmay Kulkarni, Reto Achermann, Irina Calciu, Sanidhya Kashyap, Ryan Stutsman, Amy Tai, and Gerd Zellweger. NrOS: Effective Replication and Sharing in an Operating System. In *15th USENIX Symposium on Operating Systems Design and Implementation, OSDI 2021, July 14-16, 2021*, pages 295–312. USENIX Association, 2021. — *19% (31/165)*

[8] Chinmay Kulkarni, Badrish Chandramouli, and Ryan Stutsman. Achieving High Throughput and Elasticity in a Larger-than-Memory Store. *Proceedings of the VLDB Endowment*, 14(8):1427–1440, 2021.

[9] Joe Novak, Ryan Stutsman, and Sneha Kumar Kasera. Auto-Scaling Cloud-Based Memory-Intensive Applications. In *12th IEEE International Conference on Cloud Computing, CLOUD 2020*. IEEE, 2020.

17% (35/205)

[10] Ankit Bhardwaj, Chinmay Kulkarni, and Ryan Stutsman. Adaptive Placement for In-memory Storage Functions. In *Proceedings of the 2020 USENIX Conference on Annual Technical Conference*, USENIX ATC'20, Berkeley, CA, USA, 2020. USENIX Association.

19% (65/348)

[11] Meysam Taassori, Rajeev Balasubramonian, Siddhartha Chhabra, Alaa Alameldeen, Manjula Peddireddy, Rajat Agarwal, and Ryan Stutsman. Compact Leakage-Free Support for Integrity and Reliability. In *Proceedings of the 47th International Symposium on Computer Architecture*, ISCA'20, 2020.

18% (77/428)

[12] Tian Zhang, Dong Xie, Feifei Li, and Ryan Stutsman. Narrowing the Gap Between Serverless and its State with Storage Functions. In *Proceedings of the ACM Symposium on Cloud Computing*, SoCC'19, 2019.
Best Paper Runner Up.

25% (39/157)

[13] Anirban Nag, C.N. Ramachandra, Rajeev Balasubramonian, Ryan Stutsman, Edouard Giacomin, Hari Kambalasubramanyam, and Pierre-Emmanuel Gaillardon. GenCache: Leveraging In-Cache Operators for Efficient Sequence Alignment. In *Proceedings of the 52nd IEEE/ACM International Symposium on Microarchitecture*, MICRO'19, 2019.

23% (79/345)

[14] Gustavo Alonso, Carsten Binnig, Ippokratis Pandis, Kenneth Salem, Jan Skrzypczak, Ryan Stutsman, Lasse Thostrup, Tianzheng Wang, Zeke Wang, and Tobias Ziegler. DPI: The Data Processing Interface for Modern Networks. In *Ninth Biennial Conference on Innovative Data Systems Research*, CIDR'19, 2019.

[15] Joe Novak, Ryan Stutsman, and Sneha Kumar Kasera. Cloud Functions for Fast and Robust Resource Auto-Scaling. In *Tenth International Conference on Communication Systems & Networks*, COMSNETS'19, 2019.

[16] Asaaf Eisenman, Asaf Cidon, Evgenya Pergament, Or Haimovich, Ryan Stutsman, Mohammad Alizadeh, and Sachin Katti. Flashield: a Hybrid Key-Value Cache that Controls Flash Write Amplification. In *Proceedings of the Sixteenth USENIX Symposium on Networked Systems Design and Implementation*, NSDI '19, 2019.

15% (49/332)

[17] Junguk Cho, Ryan Stutsman, and Jacobus Van der Merwe. MobileStream: A Scalable, Programmable and Evolvable Mobile Core Control Plane Platform. In *Proceedings of the 14th International Conference on Emerging Networking Experiments and Technologies*, CoNEXT'18, December 2018.

17% (32/185)

[18] Chinmay Kulkarni, Sara Moore, Mazhar Naqvi, Tian Zhang, Robert Ricci, and Ryan Stutsman. Splinter: Bare-Metal Extensions for Multi-Tenant Low-Latency Storage. In *Proceedings of the Thirteenth USENIX Symposium on Operating Systems Design and Implementation*, OSDI '18, 2018.

18% (47/257)

[19] Aleksander Maricq, Dmitry Duplyakin, Ivo Jimenez, Carlos Maltzahn, Ryan Stutsman, and Robert Ricci. Taming Performance Variability. In *Proceedings of the Thirteenth USENIX Symposium on Operating Systems Design and Implementation*, OSDI '18, 2018.

18% (47/257)

[20] Binh Nguyen, Tian Zhang, Bozidar Radunovic, Ryan Stutsman, Thomas Karagiannis, Jakub Kocur, and Jacobus Van der Merwe. ECHO: A Reliable Distributed Cellular Core Network for Hyper-scale Public Clouds. In *Proceedings of the 24th Annual International Conference on Mobile Computing and Networking*, Mobicom'18, October 2018.

22% (42/187)

[21] Yacine Taleb, Ryan Stutsman, Gabriel Antoniu, and Toni Cortes. Tailwind: Fast and Atomic RDMA-based Replication. In *Proceedings of the 2018 USENIX Annual Technical Conference*, USENIX ATC '18, Boston, MA, 2018. USENIX Association. *21% (79/378)*

[22] Tao Zhu, Zhuoyue Zhao, Feifei Li, Weining Qian, Aoying Zhou, Dong Xie, Ryan Stutsman, Haining Li, and Huiqi Hu. Towards a Shared-Everything Database on Distributed Log-Structured Storage. In *Proceedings of the 2018 USENIX Annual Technical Conference*, USENIX ATC '18, Boston, MA, 2018. USENIX Association. *21% (79/378)*

[23] Chinmay Kulkarni, Aniraj Kesavan, Tian Zhang, Robert Ricci, and Ryan Stutsman. Rocksteady: Fast Data Migration for Low-latency In-memory Storage. In *Proceedings of the Twenty-Sixth ACM Symposium on Operating Systems Principles*, SOSP '17, 2017. *16% (39/241)*

[24] Asaf Cidon, Daniel Rushton, Stephen M. Rumble, and Ryan Stutsman. Memshare: Memory Resource Sharing in Multi-tenant Web Caches. In *Proceedings of the 2017 USENIX Conference on Annual Technical Conference*, USENIX ATC'17, Berkeley, CA, USA, 2017. USENIX Association. *21% (60/283)*

[25] Ryan Stutsman, Collin Lee, and John Ousterhout. Experience with Rules-Based Programming for Distributed, Concurrent, Fault-Tolerant Code. In *Proceedings of the 2015 USENIX Conference on Annual Technical Conference*, USENIX ATC'15, Santa Clara, CA, July. *21% (47/226)*

[26] Justin Levandoski, David Lomet, Sudipta Sengupta, Ryan Stutsman, and Rui Wang. Multi-version Range Concurrency Control in Deuteronomy. *Proceedings of the VLDB Endowment*, 8(13):2146–2157, September 2015. *21% (151/710)*

[27] Darko Makreshanski, Justin Levandoski, and Ryan Stutsman. To Lock, Swap, or Elide: On the Interplay of Hardware Transactional Memory and Lock-free Indexing. *Proceedings of the VLDB Endowment*, 8(11):1298–1309, July 2015. *21% (151/710)*

[28] Justin Levandoski, David Lomet, Sudipta Sengupta, Ryan Stutsman, and Rui Wang. High Performance Transactions in Deuteronomy. In *Seventh Biennial Conference on Innovative Data Systems*, CIDR'15, 2015.

[29] Asaf Cidon, Stephen M. Rumble, Ryan Stutsman, Sachin Katti, John Ousterhout, and Mendel Rosenblum. Copysets: Reducing the Frequency of Data Loss in Cloud Storage. In *Proceedings of the 2013 USENIX Conference on Annual Technical Conference*, USENIX ATC'13, pages 37–48, Berkeley, CA, USA, 2013. USENIX Association. *14% (33/235)*
Best Student Paper Award.

[30] Diego Ongaro, Stephen M. Rumble, Ryan Stutsman, John Ousterhout, and Mendel Rosenblum. Fast Crash Recovery in RAMCloud. In *Proceedings of the Twenty-Third ACM Symposium on Operating Systems Principles*, SOSP '11, pages 29–41, New York, NY, USA, 2011. ACM. *18% (28/153)*

[31] Arjun Roy, Stephen M. Rumble, Ryan Stutsman, Philip Levis, David Mazières, and Nickolai Zeldovich. Energy Management in Mobile Devices with the Cinder Operating System. In *Proceedings of the Sixth European Conference on Computer Systems*, EuroSys '11, pages 139–152, New York, NY, USA, 2011. ACM. *15% (24/161)*

[32] Ryan Stutsman, Mikhail Atallah, Christian Grothoff, and Krista Grothoff. Lost in Just the Translation. In *Proceedings of the 2006 ACM Symposium on Applied Computing*, pages 338–345. ACM, April 2006. *32% (300/927)*

Refereed Workshop Publications

[33] Samanta, Amit, Faraz Ahmed, Lianjie Cao, Ryan Stutsman, and Puneet Sharma. Persistent memory-aware scheduling for serverless workloads. In *2023 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pages 615–621, 2023.

[34] Samanta, Amit and Ryan Stutsman. A case of multi-resource fairness for serverless workflows (work in progress paper). ICPE '23 Companion, page 45–50, New York, NY, USA, 2023. Association for Computing Machinery.

[35] Ankit Bhardwaj, Todd Thornley, Vinita Pawar, Reto Achermann, Gerd Zellweger, and Ryan Stutsman. Cache-coherent Accelerators for Persistent Memory Crash-consistency. In *Proceedings of the 14th ACM Workshop on Hot Topics in Storage and File Systems*. Association for Computing Machinery, 2022.
Intel Best Paper Award.

[36] Yuhong Zhong, Hongyi Wang, Yu Jian Wu, Asaf Cidon, Ryan Stutsman, Amy Tai, and Junfeng Yang. BPF for Storage: An Exokernel-Inspired Approach. In *HotOS '21: Workshop on Hot Topics in Operating Systems, Ann Arbor, Michigan, USA, June, 1-3, 2021*, pages 128–135. ACM, 2021.

[37] Ankit Bhardwaj, Meghana Gupta, and Ryan Stutsman. On the Impact of Isolation Costs on Locality-aware Cloud Scheduling. In *Proceedings of the 12th USENIX Conference on Hot Topics in Cloud Computing*, HotCloud'20, Berkeley, CA, USA, 2020. USENIX Association.

[38] Jared Plumb, Sneha Kasera, and Ryan Stutsman. Hybrid Network Clusters Using Common Gameplay for Massively Multiplayer Online Games. In *Foundations of Digital Games*, FDG '18, 2018.

[39] Jared Plumb and Ryan Stutsman. Exploiting Google's Edge Network for Massively Multiplayer Online Games. In *IEEE 2nd International Conference on Fog and Edge Computing*, ICFEC '18, 2018.

[40] Tian Zhang and Ryan Stutsman. JavaScript for Extending Low-latency In-memory Key-value Stores. In *Proceedings of the 9th USENIX Conference on Hot Topics in Cloud Computing*, HotCloud'17, Berkeley, CA, USA, 2017. USENIX Association.

[41] Aniraj Kesavan, Robert Ricci, and Ryan Stutsman. To Copy or Not to Copy: Making In-Memory Databases Fast on Modern NICs. In *4th Workshop on In-memory Data Management*, 2016.

[42] Mohammed Al-Mahfoudh, Ganesh Gopalakrishnan, and Ryan Stutsman. Toward Bringing Distributed Systems Design Upon Rigorous Footing. In *IEEE Workshop on Formal Methods and Integration (FMi)*, 2016.

[43] Mohammed Al-Mahfoudh, Ganesh Gopalakrishnan, and Ryan Stutsman. Toward Rigorous Design of Domain-Specific Distributed Systems. In *4th IEEE/ACM FME Workshop on Formal Methods in Software Engineering, FormaliSE 2016, Austin, Texas, May 15, 2016*.

[44] Ryan Stutsman and John Ousterhout. Toward Common Patterns for Distributed, Concurrent, Fault-Tolerant Code. In *Proceedings of the 13th USENIX Conference on Hot Topics in Operating Systems*, HotOS'13, Berkeley, CA, USA, 2013. USENIX Association.

[45] Stephen M. Rumble, Diego Ongaro, Ryan Stutsman, Mendel Rosenblum, and John K. Ousterhout. It's Time for Low Latency. In *Proceedings of the 13th USENIX Conference on Hot Topics in Operating Systems*, HotOS'11, pages 11–15, Berkeley, CA, USA, 2011. USENIX Association.

[46] Stephen M. Rumble, Ryan Stutsman, Philip Levis, David Mazières, and Nickolai Zeldovich. Apprehending Joule Thieves with Cinder. In *MobiHeld '09: Proceedings of the 1st ACM Workshop on Networking, Systems, and Applications for Mobile Handhelds*, pages 49–54, 2009.

[47] Jad Naous, Ryan Stutsman, David Mazières, Nick McKeown, and Nickolai Zeldovich. Delegating Network Security with More Information. In *Proceedings of the 1st ACM Workshop on Research on Enterprise Networking*, WREN '09, pages 19–26, 2009.

[48] Christian Grothoff, Krista Grothoff, Ludmila Alkhutova, Ryan Stutsman, and Mikhail Atallah. Translation-Based Steganography. In *Proceedings of Information Hiding Workshop*, IH 2005, pages 213–233. Springer-Verlag, 2005.

Other/Invited Publications

[49] Chinmay Kulkarni, Aniraj Kesavan, Robert Ricci, and Ryan Stutsman. Beyond Simple Request Processing with RAMCloud. *IEEE Data Engineering Bulletin*, 40(1):62–69, 2017.

[50] Justin J. Levandoski, Sudipta Sengupta, Ryan Stutsman, and Rui Wang. Transaction processing techniques for modern hardware and the cloud. *IEEE Data Engineering Bulletin*, 38(1):50–57, 2015.

[51] John Ousterhout, Parag Agrawal, David Erickson, Christos Kozyrakis, Jacob Leverich, David Mazières, Subhasish Mitra, Aravind Narayanan, Diego Ongaro, Guru Parulkar, Mendel Rosenblum, Stephen M. Rumble, Eric Stratmann, and Ryan Stutsman. The Case for RAMCloud. *Communications of the ACM*, 54(7):121–130, July 2011.

[52] Stephen M. Rumble, Ryan Stutsman, Philip Levis, David Mazières, and Nickolai Zeldovich. Apprehending Joule Thieves with Cinder. *SIGCOMM Computer Communication Review*, 40(1):106–111, 2010.

[53] John Ousterhout, Parag Agrawal, David Erickson, Christos Kozyrakis, Jacob Leverich, David Mazières, Subhasish Mitra, Aravind Narayanan, Guru Parulkar, Mendel Rosenblum, Stephen M. Rumble, Eric Stratmann, and Ryan Stutsman. The Case for RAMClouds: Scalable High-Performance Storage Entirely in DRAM. *SIGOPS Operating Systems Review*, 43(4):92–105, December 2009.

Conference Presentations

- The Cloud Without the Fluff: Rethinking Resource Disaggregation. HPTS 2019.

- Multi-version Range Concurrency Control in Deuteronomy. VLDB'16.

- Experience with Rules-Based Programming for Distributed, Concurrent, Fault-Tolerant Code. USENIX ATC'15.

- High Performance Transactions in Deuteronomy. CIDR 2015.

- Toward Common Patterns for Distributed, Concurrent, Fault-Tolerant Code. HotOS'13.

- Fast Crash Recovery in RAMCloud. SOSP '11.

- Energy Management in Mobile Devices with the Cinder Operating System. EuroSys '11.

- Apprehending Joule Thieves with Cinder. MobiHeld '09.

- Lost in Just the Translation. ACM SAC '06.

Invited Talks

- eBPF for Accelerating Data-Intensive Applications. Invited Talk, Meta Core Systems Annual Faculty Summit, 2022.

- Managing Hardware Isolation Costs for I/O-intensive Workloads. Invited Talk, Amazon AWS, 2021.

- Adaptive Placement for In-memory Storage Functions. Invited Talk, Facebook Core Systems Annual Faculty Summit, 2020.

- DARPA ISAT "Low-Latency Systems Workshop" Invited Talk, San Jose, CA, 2020.

- Massive Main-Memory for the Masses. Invited Talk, École Polytechnique Fédérale de Lausanne (EPFL), 2018.

- Massive Main-Memory for the Masses. Invited Talk, Institut National de Recherche en Informatique et en Automatique (INRIA Rennes), 2018.

- The RAMCloud Storage System, Invited Talk, Huawei Research Silicon Valley, 2016.

- A Pattern for Programming Large-Scale Fault-Tolerant Systems, University of Utah, 2014.

- Durability and Crash Recovery for Distributed In-memory Storage, Facebook, 2013.

- Durability and Crash Recovery for Distributed In-memory Storage, University of Utah, 2013.

- Durability and Crash Recovery for Distributed In-memory Storage, Purdue University, 2013.

- Durability and Crash Recovery for Distributed In-memory Storage, University of British Columbia, 2013.

- Durability and Crash Recovery for Distributed In-memory Storage, University of Maryland, 2013.

- DARPA ISAT "Future Ideas Symposium" Invited Talk, Washington D.C., 2010.

Patents

Patents Issued

- Auto-scaling Cloud-based Memory-Intensive Applications, 2022; Patent #11307895B2.

- High Performance Transactions in Database Management Systems, 2018; Patent #9928264.

- Controlling Atomic Updates of Indexes Using Hardware Transactional Memory, 2018; Patent #10067960.

Disclosures

- Auto-scaling cloud-based memory-intensive applications, 2020; Pending.

Software Contributions and Distributions

- Splinter Multi-tenant Extensible Key-Value Store:
  http://github.com/utah-scs/splinter/.

- LSM-Sim Scale-out Web-Cache Simulator:
  http://github.com/utah-scs/lsm-sim/.

- RAMCloud large-scale, low-latency key-value store:
  https://github.com/PlatformLab/RAMCloud; 390 Stars, 123 Forks on github.

- Cinder from-scratch OS for mobile phones with first class energy management:
  http://www.scs.stanford.edu/cinder/.

- Rose source-to-source compiler for automated program transforms:
  http://www.rosecompiler.org/.

- Autotest release-driven distributed regression testing for the Linux kernel:
  http://autotest.github.io/.

Industrial Impact

- TIBCO ActiveSpaces implements Copysets (ATC'13), http://www.tibco.com/products/tibco-activespaces.

- 2017 Microsoft Research Redmond Lab Outstanding Research Project Award (joint with James Hunter, Justin Levandoski, David Lomet, Ryan Stutsman, and Sudipta Sengupta).

Media Exposure

01/20 Hacker News Frontpage, *Narrowing the gap between serverless and its state with storage functions.*

01/20 The Morning Paper, *Narrowing the gap between serverless and its state with storage functions.*

08/17 The Morning Paper, *JavaScript for Extending Low-latency In-memory Key-value Stores.*

01/16 The Morning Paper, *Experience with Rules-Based Programming for Distributed Concurrent Fault-Tolerant Code.*

11/11 Ars Technica, *Can DRAM replace hard drives and SSDs? RAMCloud creators say yes.*

10/11 HPC Wire, *RAMCloud: When Disks and Flash Memory are Just Too Slow.*

10/11 ZDNet, *RAMCloud puts everything in DRAM.*

Teaching

- 22'–23' AY University of Utah Price College of Engineering Outstanding Teaching Award

- 22'–23' AY University of Utah Kahlert School of Computing Outstanding Teaching Award

- 16'–17' AY University of Utah School of Computing Outstanding Teaching Award

- Dean's teaching commendation letter for Distributed Systems (Fall 2017, Fall 2018, Fall 2020,Fall 2022) Operating Systems (Spring 2018, Spring 2019, Spring 2020, Spring 2021, Spring 2022,Fall 2022) and Computer Networks (Spring 2023) for teaching evaluation ratings in the top 15% in the College.

Spring 2024 Instructor, CS4480 Computer Networks. University of Utah. 169 students; undergraduates.

Fall 2023 Instructor, CS6465 Advanced Operating Systems Implementation. University of Utah. 24 students; combined undergraduate/graduates.
Course Rating: 5.86/6, Instructor Rating: 5.95/6.

Spring 2023 Instructor, CS4480 Computer Networks. University of Utah. 155 students; undergraduates.
Course Rating: 5.38/6, Instructor Rating: 5.71/6.

Fall 2022 Instructor, CS6450 Distributed Systems. University of Utah. 57 students; combined undergraduate/graduates.
Course Rating: 5.88/6, Instructor Rating: 5.91/6.

Spring 2022 Instructor, CS5460/6460 Operating Systems. University of Utah. 103 students; combined undergraduate/graduates.
Course Rating: 5.82/6, Instructor Rating: 5.90/6.

Fall 2021 Sabbatical.

Spring 2021 Instructor, CS5460/6460 Operating Systems. University of Utah. 132 students; combined undergraduate/graduates.
Course Rating: 5.78/6, Instructor Rating: 5.85/6.

Fall 2020 Instructor, CS6450 Distributed Systems. University of Utah. 37 graduate/undergraduate students.
Course Rating: 5.83/6, Instructor Rating: 5.93/6.

Spring 2020 Instructor, CS5460/6460 Operating Systems. University of Utah. 120 students; combined undergraduate/graduates.
Course Rating: 5.74/6, Instructor Rating: 5.90/6.

Fall 2019 Instructor, CS6465 Advanced Operating Systems Implementation. University of Utah. 13 students; combined undergraduate/graduates.
Course Rating: 5.44/6, Instructor Rating: 5.86/6.

Spring 2019 Instructor, CS5460/6460 Operating Systems. University of Utah. 166 students; combined undergraduate/graduates.
Course Rating: 5.63/6, Instructor Rating: 5.78/6.

Fall 2018 Instructor, CS6450 Distributed Systems. University of Utah. 28 graduate/undergraduate students.
Course Rating: 5.67/6, Instructor Rating: 5.80/6.

Spring 2018 Instructor, CS5460/6460 Operating Systems. University of Utah. 147 students; combined undergraduate/graduates.
Course Rating: 5.63/6, Instructor Rating: 5.85/6.

Spring 2018 Instructor, CS7943 Database Systems Seminar. University of Utah. 4 graduate students.

Fall 2017 Instructor, CS6450 Distributed Systems. University of Utah. 34 (mostly) graduate students.
Course Rating: 5.84/6, Instructor Rating: 5.96/6.

Spring 2017 Instructor, CS7943 Database Systems Seminar. University of Utah. 7 graduate students.

Fall 2016 Instructor, CS6963 Distributed Systems. University of Utah. 30 graduate students.
Course Rating: 5.49/6, Instructor Rating: 5.70/6.

Spring 2016 Instructor, CS5460/6460 Operating Systems. University of Utah. 123 students; combined undergraduate/graduates.
Course Rating: 5.46/6, Instructor Rating: 5.78/6.

Fall 2015 Instructor, CS6963 Distributed Systems. University of Utah. 19 graduate students.
Course Rating: 5.73/6, Instructor Rating: 5.85/6.

Winter 2012 Teaching Assistant, CS244B Distributed Systems. Stanford University. 45 students.

Winter 2008 Teaching Assistant, CS240 Advanced Operating Systems. Stanford University. 30 students.

Spring 2007 Teaching Assistant, CS180 An Introduction to Computer Science. Purdue University. 30 students in section.

Advising

Student Awards

Ankit Bhardwaj, 2021 Meta PhD Fellowship Honorable Mention.
Chinmay Kulkarni, 2019 Google PhD Fellowship.

Ph.D. Advising at Utah

Current

Vinita Pawar, Independent Study, 2024 - 2028.

James McMahon, 2022 - 2027; **Thesis topic:** *Remote Memory Prefetching for Emerging Cache Coherent Disaggregated Architectures.*

Md Ashfaqur Rahaman, 2021 - 2026;
Thesis topic: *Dynamic and Portable Code Migration for Disaggregated Memory Systems.*

Amit Samanta, 2020 - 2025;
Thesis topic: *Multi-resource Fairness in Serverless Platforms.*

Graduated

Ankit Bhardwaj, 2018 - 2023;
Thesis topic: *Dynamic Code Migration for Kernel-bypass Stores.*

Tian (Candy) Zhang, 2015 - 2021;
First employment: Google
Thesis topic: *Stateful Kernel-bypass Serverless Functions.*

Chinmay Kulkarni, 2016 - 2021;
First employment: Lightstep
Thesis topic: *State Migration in Scale-out Storage.*

Mohammed Al-Mahfoudh (Co-advised with Ganesh Gopalakrishnan), 2015 - 2021;
Thesis topic: *Linearizabilitiy Checking of Actor Systems.*

MS Advising at Utah

Graduated

Todd Thornley, Research Assistant, 2020 - present.
Project Topic: *Designing Data Structures for Programmable Disaggregated Memory.*

Vinita Pawar, Independent Study, 2022 - 2022.
Project Topic: *Simulating Crash-consistent Persistent Memory.*

Meghana Gupta, Research Assistant, 2019 - 2021.
First employment: Microsoft.
Project Topic: *Isolation-cost Aware Request Dispatch.*

Akshay Singh, Independent Study, 2019 - 2020.
Project Topic: *Container Scheduling for a Kernel-bypass-based Store.*

Mazhar Naqvi, Research Assistant, 2018 - 2019;
First employment: Microsoft.
Project Topic: *Adaptive Storage Function Placement.*

Paridhi Baheti, Independent Study & MS Project, 2018 - 2019;
First employment: Microsoft.
Project Topic: *Pub-sub Queues for Extensible In-memory Stores.*

Aniraj Kesavan (Co-advised with Robert Ricci), Research Assistant, 2015 - 2017;
First employment: LinkedIn
Thesis: *Making Large Transfers Fast for In-memory Databases in Modern Networks.*

Undergraduate Advising at Utah

  Graduated

  Emerson Ford, BS Thesis, August 2020 - May 2022;
  First employment: Meta.
  Thesis: *Explaining and Evaluating the Use of RDMA in High Performance Containers*.

  Daniel Rushton, BS Thesis, October 2015 - May 2018 (USENIX Travel Grant Recipient);
  First employment: Nvidia.
  Thesis: *RDMA-accelerated Container Networks for HPC*.

  Aaron Langford, BS Thesis, January 2018 - August 2018;
  First employment: Amazon.
  Thesis: *Scheduling Lightweight Untrusted Tasks in Rust*.

  Sara Moore, REU Student, January 2018 - May 2018;
  First employment: InsideSales.
  Project Topic: *Social Graph Operations for Programmable Key-Value Stores*.

Non-chair Member of Graduate Student Committees

Ph.D. Committees - Active

Abishek Ramdas, Ph.D. (ETH Zurich); Graduating 2023; Advisor: Mothy Roscoe.
Vikram Narayanan, Ph.D.; Graduating 2023; Advisor: Anton Burtsev.

Ph.D. Committees - Graduated

Yanqing Peng, Ph.D.; Graduating 2022; Advisor: Jeff Phillips.
Rufaida Ahmed, Ph.D.; Graduated 2021; Advisor: Robert Ricci.
Zhuoyue Zhao, Ph.D.; Graduated 2021; Advisor: Feifei Li.
Karl Taht, Ph.D.; Graduated 2020; Advisor: Rajeev Balasubramonian.
Maryam Dabaghchian, Ph.D.; Graduated 2020; Advisor: Zvonimir Rakamaric.
Dong Xie, Ph.D.; Graduated 2020; Advisor: Feifei Li.
Cai (Richard) Li, Ph.D.; Graduated 2020; Advisor: Eric Eide.
Joe Novak, Ph.D.; Graduated 2019; Advisor: Sneha Kasera.
Ren Quinn, Ph.D.; Graduated 2019; Advisor: Jacobus Van Der Merwe.
Aisha Syed, Ph.D.; Graduated 2019; Advisor: Jacobus Van Der Merwe.
Mohammed-Yacine Taleb, Ph.D. (INRIA Rennes); Graduated 2018; Advisor: Gabriel Antoniu.
George Prekas, Ph.D. (EPFL); Graduated 2018; Advisor: Edouard Bugnion.
Hyun-Wook Baek, Ph.D.; Graduated 2018; Advisor: Jacobus Van Der Merwe.
Junguk Cho, Ph.D.; Graduated 2018; Advisor: Jacobus Van Der Merwe.
David Hancock, Ph.D.; Graduated 2018; Advisor: Jacobus Van Der Merwe.
Binh Nguyen, Ph.D.; Graduated 2017; Advisor: Jacobus Van Der Merwe.
Simone Atzeni, Ph.D.; Graduated 2017; Advisor: Ganesh Gopalakrishnan.

Non-Course-Only MS Committees

Sai Varun Addanki, MS; Graduated 2020; Advisor: Alexander Lex.
Abubaker Abdelmutalab, MS; Graduated 2020; Advisor: Robert Ricci.
Robert Weischedel, MS; Graduated 2019; Advisor: Pierre-Emmanuel Gaillardon.
Pavithra Chidambaram Pappa, MS; Graduated 2019; Advisor: Sneha Kasera.
Sonika Jindal, MS; Graduated 2019; Advisor: Robert Ricci.
Zirak Zaheer, MS; Graduated 2018; Advisor: Jacobus Van Der Merwe.
Michael Zhang, MS; Graduated 2018; Advisor: Chris Meyers.
Abhiram Balasubramanian, MS; Graduated 2017; Advisor: Anton Burtsev.

Robert Christensen, MS; Graduated 2017; Advisor: Feifei Li.
Rui Dai, MS; Graduated 2017; Advisor: Feifei Li.
Keith Downie; Advisor: Robert Ricci.
Jiten Thakkar, MS; Graduated 2017; Advisor: Ganesh Gopalakrishnan.
Charles Jabcobsen, MS; Graduated 2016; Advisor: Anton Burtsev.

Department, College, and University Service

Departmental Committee Service

- Kahlert School of Computing Curriculum Committee Chair, 2022-;

- School of Computing Curriculum Committee Member, 2020-2021;

- School of Computing Informal RPT Committee, 2022-2023;

- School of Computing Faculty Search Committee, 2017, 2021;

- University of Utah School of Computing Outstanding Teaching/TA Awards Selection Committee, AY '17-'18;

- School of Computing Ph.D. Admissions Committee, 2014, 2015, 2016, 2018, 2020.

Miscellaneous Departmental Service

- Kahlert School of Computing Undergraduate Research Committee Member, 2022-;

- Panelist, University of Utah/Stena Center FintechXchange Summit, 2023, 2024;

- College of Engineering Engineering Day Session Organizer, "Undergraduate Research in Computer Science", 2020;

- School of Computing Mock Panel Participant, 2019, 2020;

- School of Computing Undergraduate Research Liaison, 2019-2021;

- School of Computing Graduate Admit Visit Day Coordinator, 2017, 2018;

- School of Computing Undergraduate Advisory Committee (UGSAC) Faculty Advisor, 2015-2021.

College Service

- College of Engineering Teaching Excellence Committee, 2023-;

- College of Engineering Scholarship Committee, 2019, 2020;

- College of Engineering Orientation Panel, 2019 ($3\times$), 2020.

University Service

- Office of Undergraduate Research Undergraduate Research Symposium Poster Judge, 2019 ($2\times$).

Professional External Service

Membership in Professional Societies

- Association for Computing Machinery, 2006-present;

- USENIX Association, 2010-present.

Proposal Panelist

- National Science Foundation (NSF), 2017, 2018, 2019 (2×), 2022, 2023.

Reviewer for Academic Journals

- ACM Transactions on Storage (TOS);

- IEEE Transactions on Cloud Computing (TOCC);

- ACM SIGMOD Transactions on Database Systems (TODS);

- IEEE Transactions on Knowledge and Data Engineering (TKDE);

- ACM SIGOPS Transactions on Computer Systems (TOCS).

Conference Organization

- USENIX ATC '25 Program Co-chair;

- ACM SoCC '21 Publications Chair;

- HotCloud '20 Program Co-chair, 22 paper program selected from 95 submissions;

- OSDI'20 Artifact Evaluation Committee Co-chair, 53 artifact submissions;

- NSDI '19 Poster Chair, 48 posters;

- Session Chair: SOSP '21, HotOS '21, NSDI '19, HotCloud '17, VLDB '16.

Reviewer for Rigorous Conferences

- ASPLOS '24, ACM International Conference on Architectural Support for Programming Languages and Operating Systems;

- SOSP '19, '21, '23, ACM Symposium on Operating Systems Principles;

- OSDI '18, '20 (Heavy Member), '23 USENIX Symposium on Operating Systems Design and Implementation;

- VLDB '17 (Industrial Track), '23 (Distinguished Reviewer), International Conference on Very Large Data Bases;

- USENIX ATC '19, '21, '24, USENIX Annual Technical Conference;

- SYSTOR '21 (Distinguished Reviewer), ACM International Systems and Storage Conference;

- NSDI'19, '21, USENIX Symposium on Networked Systems Design and Implementation;

- HotCloud '19 (Workshop), USENIX Workshop on Hot Topics in Cloud Computing;

- ICDCS '18, IEEE International Conference on Distributed Computing Systems;

- EDBT '18, International Conference on Extending Database Technology;

- ICDE '18, IEEE International Conference on Data Engineering;

- SIGMOD '17, '18, ACM SIGMOD International Conference on Management of Data.
  (**Awarded Distinguished Program Committee Member both times**);

- SIGMOD '16 Demo Committee, ACM SIGMOD International Conference on Management of Data;

- ICDE '16, IEEE International Conference on Data Engineering;

- IMDM '14, '15, '16, International Workshop on In-Memory Data Management and Analytics;

- SIGMETRICS '15, ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems.

Other Reviews

- ACM SOSP Doctoral Workshop Reviewer, 2023;

- Computing Research Association (CRA) CSGrad4US Fellowship Reviewer, 2023;

- ACM Transactions on Cloud Computing (ToCC);

- ACM SIGOPS Operating Systems Review (OSR).

Outreach Activities

- FIRST Lego League Junior, Assistant Coach for team of 6 girls ages 6 to 7, 2018-2019 and 2019-2020 Seasons;

- University of Utah IT Professionals Meeting Invited Talk, "An Overview of Recent Speculative Execution Vulnerabilities", June 2019;

- Oregon-Davis Junior/Senior High School; Invited Speaker to 9th through 12th grade students about STEM and STEM research careers; Hamlet, Indiana; 2015.

February 19, 2024