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## Education

- 1997 Ph.D., Computer Science, University of California, Los Angeles.  
1974 M.S., Computer Science, Michigan State University, 1974. Minor: Linguistics.  
1973 B.S. *cum laude*, Computer Science and Electrical Engineering, Michigan State University, 1973.  
Minor: Music theory.

## Areas of Research

File systems, distributed and replicated systems, computer systems tracing, performance measurement, solid-state storage, experimental methodology.

## Research Grants

- 2019–2023 *Optimizing and Understanding Large Parameter Spaces in Storage Systems*, NSF.  
2017–2020 *National File System Trace Repository*, NSF.  
2013–2016 *Workload-Aware Storage Architectures for Optimal Performance and Energy Efficiency*, NSF.  
2013–2016 *National File System Trace Repository*, NSF.  
2014 *Big Data, Small Energy*, Rose Hills Foundation.  
2013 *Fundamental Advance in National and International Cyber Security Curricula for Core Computer Science and Engineering Classes*, Intel Corporation.  
2009–2012 *Modular CS1 from the Inside Out: Computational Thinking for all STEM Students*, NSF.  
2009–2012 *Performance- and Energy-Aware HEC Storage Stacks*, NSF.  
2009–2011 *File System Trace Repository*, NSF.  
2006–2008 *File System Trace Repository*, NSF.  
2003 *Analysis of Operating System Scheduler Behavior*, Beckman Foundation.  
2001 *Support Tools for Memory-Based Filesystem*, NSF.  
1999 *Active-Network Applications*, Beckman Foundation.  
1997 *Investigation of clustering methods*, Microsoft Corporation.  
1994–1996 *TRAVLER mobile computing project*, ARPA, 1994–1996 (under supervision of G. Popek).

## Appointments

- 2010– **Professor**, Harvey Mudd College  
2011–2017 **Director of Computer Science Clinic**, Harvey Mudd College  
2005–2006 **Acting Director of Computer Science Clinic**, Harvey Mudd College  
2004–2010 **Associate Professor**, Harvey Mudd College  
1998–2004 **Assistant Professor**, Harvey Mudd College  
1998–2003 **Consultant**, UCLA LASR research group

1984– **Principal Consultant**, Interrupt Technology Corporation  
1997–1998 **Postdoctoral Researcher**, UCLA Computer Science Department  
1991–1997 **Research Assistant**, UCLA Computer Science Department  
1990–1991 **Teaching Assistant**, UCLA Computer Science Department  
1983–1984 **Manager of Operating Systems Development**, Callan Data Systems  
1979–1983 **Independent Consultant**  
1977–1979 **Senior Software Engineer**, Digital Equipment Corporation  
1975–1977 **Systems Programmer**, Ball Computer Products  
1974–1975 **Computer Scientist**, Lawrence Livermore Laboratory  
1970–1974 **Systems Programmer**, Michigan State University Computer Center

## Teaching History

### Undergraduate Courses Taught

Data Structures and Program Development; Architecture and Operating Systems; Computer Systems; Advanced Operating Systems; Computer Systems Performance Analysis; Advanced Computer Architecture; Introduction to Computer Science; File Systems; Introduction to Academic Writing

### One-Day Courses Taught

Experimental Methodology for Software Systems.

### Graduate Courses Taught

Experimental Methodology for Software Systems.

### Industry Courses Taught

X Windows Internals, Unix Kernel Internals.

## Honors and Awards

2015 NCWIT EngageCSEdu Engagement Excellence Award  
2000 Outstanding Reviewer, IEEE Internet Computing Magazine  
1997 UCLA Engineering Achievement Award  
1989 UCLA Chancellor's Fellow in Computer Science

## Professional Service

Co-chair, Usenix Annual Technical Conference (ATC '21)

Associate Editor, ACM Transactions on Storage, 2019–

Co-chair, 15<sup>th</sup> Usenix Conference on File and Storage Technologies (FAST '17)

Co-chair (2007–present) SNIA I/O Tools, Traces, and Analysis Working Group

NSF Panelist (2004, 2005, 2005, 2010, 2014, 2017)

Refereeing: ACM Mobile Computing and Communications Review; ACM Symposium on Applied Computing; ACM Symposium on Operating Systems Principles (SOSP); ACM Transactions on Dependable and Secure Computing; ACM Transactions on Storage; CPSR Student Essay Contest; Encyclopedia of Computer Science; IEEE Computer; IEEE Infocom; IEEE Internet Computing; IEEE Personal Technologies; IEEE Transactions on Computers; IEEE Wireless Networks; International Journal of Computers and Applications; Mobicom; SIGCSE Annual Conference; Software—Practice and Experience; Symposium on Applied Corporate Computing;

Usenix Annual Technical Conference (ATC); Usenix Conference on File and Storage Technologies (FAST)

Program committees: International Workshop on Active Middleware Services; SustainIT Workshop; Usenix Annual Technical Conference (ATC); Usenix Conference on File and Storage Technologies (FAST); Usenix Conference on Hot Topics in Storage Systems (HOTSTORAGE); Usenix Symposium on Internet Technologies and Systems (USITS)

Treasurer, 2009 ACM Symposium on Operating Systems Principles (SOSP)

## Professional Organizations

ACM, IEEE Computer Society, Usenix, PFIR, EFF, Sigma Xi, SIGOPS, SIGMETRICS

## Citizenship

United States Citizen

## Languages

Fluent in both English and German; some French and Italian

## Expert Witness

- 2014 *Riverbed Technology, Inc., v. Silver Peak Systems, Inc.*, Case IPR2014-00245, United States Patent Trial and Appeal Board
- 2005 *Research in Motion, Ltd., v. InPro Licensing S.A.R.L.*
- 2003 *Interealty v. MRMLS*
- 2000 *Sun Microsystems v. Microsoft Corp.* (no action filed)
- 1992 *Digital Equipment Corp. v. Clearpoint Research Corp.*, Civil Action No. 91-11344-H, Federal District Court (Mass.)

## Publications

### Refereed Journals

- [1] Zhen “Jason” Sun, Geoff Kuenning, Sonam Mandal, Philip Shilane, Vasily Tarasov, Nong Xiao, and Erez Zadok. Cluster and single-node analysis of long-term deduplication patterns. *ACM Transactions on Storage*, 14(2), May 2018.
- [2] Ming Chen, Geetika Babu Banger, Dean Hildebrand, Farhaan Jalia, Geoff Kuenning, Henry Nelson, and Erez Zadok. vNFS: Maximizing NFS performance with compounds and vectorized I/O. *ACM Transactions on Storage*, 13(3):21:1–21:24, 2017.
- [3] Sarah Diesburg, Christopher Meyers, Mark Stanovich, An-I Andy Wang, and Geoff Kuenning. TrueErase: Leveraging an auxiliary data path for per-file secure deletion. *ACM Transactions on Storage*, 12(4), August 2016.
- [4] Charles Weddle, Mathew Oldham, Jin Qian, An-I Andy Wang, Peter Reiher, and Geoff Kuenning. PARAD: A gear-shifting power-aware RAID. *ACM Transactions on Storage*, 3(3), October 2007.
- [5] An-I Andy Wang, Geoff Kuenning, and Peter Reiher. Using permuted states and validated simulation to analyze conflict rates in optimistic replication. *SCS Simulation: Transactions of the Society for Modeling and Simulation International*, 83(8):551–569, August 2007.
- [6] An-I Andy Wang, Geoff Kuenning, Peter Reiher, and Gerald Popek. The Conquest file system: Better performance through a disk/persistent-RAM hybrid design. *ACM Transactions on Storage*, 2(3):309–348, August 2006.

- [7] Nam T. Nguyen, An-I Andy Wang, Peter Reiher, and Geoff Kuenning. Electric-field-based routing: A reliable framework for routing in manets. *ACM Mobile Computing and Communications Review*, 2(2), April 2004.
- [8] David Ratner, Peter Reiher, Gerald J. Popek, and Geoffrey H. Kuenning. Replication requirements in mobile environments. *Mobile Networks and Applications*, 6(6):525–534, November 2001.
- [9] Alexey Rudenko, Peter Reiher, Gerald Popek, and Geoffrey H. Kuenning. Saving portable computer battery power through remote process execution. *ACM Mobile Computing and Communications Review*, 2(1), Winter 1998.
- [10] T. W. Page, R. G. Guy, J. S. Heidemann, D. Ratner, P. Reiher, A. Goel, G. H. Kuenning, and G. J. Popek. Perspectives on optimistically replicated peer-to-peer filing. *Software—Practice and Experience*, 28(2):155–180, February 1998.
- [11] Geoffrey H. Kuenning, Peter Reiher, and Gerald J. Popek. Experience with an automated hoarding system. *Personal Technologies*, 1(3):145–155, September 1997.
- [12] Geoffrey H. Kuenning. Kitrace: Precise interactive measurement of operating systems kernels. *Software—Practice and Experience*, 25(1):1–22, January 1995.

#### Refereed Conferences

- [1] Wei Su, Yifei Liu, Gomathi Ganesan, Gerard Holzmann, Geoff Kuenning, Scott Smolka, and Erez Zadok. Model-checking support for file system development. In *Proceedings of the USENIX Workshop on Hot Topics in Storage and File Systems*, Virtual, July 2021. ACM.
- [2] Ibrahim Umit Akgun, Geoff Kuenning, and Erez Zadok. Re-animator: Versatile high-fidelity storage-system tracing and replaying. In *Proceedings of the 13th ACM International Systems and Storage Conference (SYSTOR)*, Haifa, Israel, October 2020.
- [3] Zhen Cao, Geoff Kuenning, and Erez Zadok. Carver: Finding important parameters for storage system tuning. In *Proceedings of the 18th USENIX Conference on File and Storage Technologies*, pages 43–57, Santa Clara, CA, February 2020. USENIX Association.
- [4] Zhen Cao, Geoff Kuenning, Klaus Mueller, Anjul Tyagi, and Erez Zadok. Graphs are not enough: Using interactive visual analytics in storage research. In *Proceedings of the USENIX Workshop on Hot Topics in Storage and File Systems*, Renton, WA, July 2019. USENIX Association.
- [5] Ming Chen, Dean Hildebrand, Henry Nelson, Jasmit Saluja, Ashok Sankar Harihara Subramony, and Erez Zadok. vNFS: Maximizing NFS performance with compounds and vectorized I/O. In *Proceedings of the 15th USENIX Conference on File and Storage Technologies*, Santa Clara, CA, February 2017. USENIX Association.
- [6] Erez Zadok, Dean Hildebrand, Geoff Kuenning, and Keith Smith. POSIX is dead! long live... errr... what exactly? In *Proceedings of the 9th USENIX Workshop on Hot Topics in Storage and File Systems*, Santa Clara, CA, July 2017. USENIX Association.
- [7] Zhen Sun, Geoff Kuenning, Sonam Mandal, Philip Shilane, Vasily Tarasov, Nong Xiao, and Erez Zadok. A long-term user-centric analysis of deduplication patterns. In *Proceedings of the 32nd International Conference on Massive Storage Systems and Technology (MSST)*, Santa Clara, CA, May 2016.
- [8] Sonam Mandal, Geoff Kuenning, Dongju Ok, Varun Shastry, Philip Shilane, Sun Zhen, Vasily Tarasov, and Erez Zadok. Using hints to improve inline block-layer deduplication. In *Proceedings of the 14th USENIX Conference on File and Storage Technologies*, Santa Clara, CA, February 2016.
- [9] Ming Chen, Dean Hildebrand, Geoff Kuenning, Soujanya Shankaranarayana, Bharat Sing, and Erez Zadok. Newer is sometimes better: An evaluation of NFSv4. In *ACM SIGMETRICS Conference Proceedings*, Portland, OR, June 2015.

- [10] Ming Chen, Dean Hildebrand, Geoff Kuenning, Soujanya Shankaranarayana, Vasily Tarasov, Erez Zadok, and Ksenia Zakirova. NFSv4.1 performance under a microscope. In *Proceedings of the USENIX Large Installation Systems Administration Conference*, Seattle, WA, November 2014. USENIX Association. Extended abstract.
- [11] Vasily Tarasov, Deepak Jain, Geoff Kuenning, Sonam Mandal, Karthikeyani Palanisami, Philip Shilane, Sagar Trehan, and Erez Zadok. Dmddedup: Device mapper target for data deduplication. In *Proceedings of the Ottawa Linux Symposium*, Ottawa, Canada, July 2014.
- [12] Vasily Tarasov, Deepak Jain, Dean Hildebrand, Renu Tewari, Geoff Kuenning, and Erez Zadok. Improving I/O performance using virtual disk introspection. In *Proceedings of the 5th USENIX Workshop on Hot Topics in Storage and File Systems*, San Jose, CA, June 2013. USENIX Association.
- [13] Adam Cozzette, Kathryn Lingel, Steve Matsumoto, Oliver Ortlieb, Jandria Alexander, Joseph Betser, Luke Florer, Geoff Kuenning, John Nilles, and Peter Reiher. Improving the security of Android inter-component communication. In *Proceedings of the IFIP/IEEE International Symposium on Integrated Network Management*, Ghent, Belgium, May 2013.
- [14] Vasily Tarasov, Dean Hildebrand, Geoff Kuenning, and Erez Zadok. Virtual machine workloads: The case for new benchmarks for NAS. In *Proceedings of the 11th USENIX Conference on File and Storage Technologies*, pages 307–320, San Jose, CA, February 2013. USENIX Association.
- [15] Sarah Diesburg, Christopher Meyers, Mark Stanovich, Michael Mitchell, Justin Marshall, Julia Gould, An-I Andy Wang, and Geoff Kuenning. TrueErase: Per-file secure deletion for the storage data path. In *Proceedings of the Annual Computer Security Applications Conference*, Orlando, FL, December 2012.
- [16] Vasily Tarasov, Amar Mudrankit, Will Buik, Philip Shilane, Geoff Kuenning, and Erez Zadok. Generating realistic datasets for deduplication analysis. In *Proceedings of the USENIX Annual Technical Conference*, Boston, MA, June 2012. USENIX Association.
- [17] V. Tarasov, S. Kumar, J. Ma, D. Hildebrand, A. Povzner, G. Kuenning, and E. Zadok. Extracting flexible, replayable models from large block traces. In *Proceedings of the 10th USENIX Conference on File and Storage Technologies*, San Jose, CA, February 2012. USENIX Association.
- [18] Zachary Dodds, Ran Libeskind-Hadas, Christine Alvarado, and Geoff Kuenning. Evaluating a breadth-first CS1 for scientists. In *SIGCSE '08: Proceedings of the 39th SIGCSE Technical Symposium on Computer Science Education*, pages 266–270, Portland, OR, March 2008. ACM.
- [19] Zach Dodds, Christine Alvarado, Geoff Kuenning, and Ran Libeskind-Hadas. Breadth-first cs 1 for scientists: Curriculum and assessment. In *ITiCSE 2007: Proceedings of the 12th Annual Conference on Technology in Computer Science Education*, pages 23–27, Dundee, Scotland, June 2007.
- [20] Charles Weddle, Mathew Oldham, Jin Qian, An-I Andy Wang, Peter Reiher, and Geoff Kuenning. PARAD: A gear-shifting power-aware RAID. In *Proceedings of the 6th USENIX Conference on File and Storage Technologies*, San Jose, California, February 2007. USENIX Association.
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- [22] Jun Li, Toby Ehrenkrantz, Geoff Kuenning, and Peter Reiher. Simulation and analysis on the resiliency and efficiency of malnets. In *Proceedings of the IEEE Symposium on Measurement, Modeling, and Simulation of Malware*, pages 262–269, Monterey, CA, June 2005. IEEE.
- [23] Jelena Mirkovic, Max Robinson, Peter Reiher, and Geoff Kuenning. Alliance formation for DDoS defense. In *Proceedings of the ACM New Security Paradigms Workshop*. ACM, August 2003.
- [24] An-I Wang, Geoffrey H. Kuenning, Peter Reiher, and Gerald J. Popek. The effects of memory-rich environments on file system microbenchmarks. In *Proceedings of the International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS)*, Montreal, Canada, July 2003.

- [25] Nam Nguyen, Peter Reiher, and Geoffrey H. Kuenning. Detecting insider threats by monitoring system call activity. In *Proceedings of the 2003 IEEE Workshop on Information Assurance*, United States Military Academy, West Point, NY, June 2003. IEEE.
- [26] An-I Wang, Peter Reiher, Rajive Bagrodia, and Geoffrey H. Kuenning. Understanding the behavior of the conflict-rate metric in optimistic peer replication. In *Proceedings of the 5th International Workshop on Mobility in Databases and Distributed Systems*, Aix-en-Provence, France, September 2002. IEEE.
- [27] Kylie M. Evans and Geoffrey H. Kuenning. A study of irregularities in file-size distributions. In *Proceedings of the International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS)*, San Diego, CA, July 2002.
- [28] An-I Andy Wang, Geoffrey H. Kuenning, Peter Reiher, and Gerald J. Popek. Conquest: Better performance through a disk/persistent-RAM hybrid file system. In *Proceedings of the 2002 USENIX Annual Technical Conference*, Monterey, CA, June 2002. USENIX Association.
- [29] Geoffrey H. Kuenning, Wilkie Ma, Peter Reiher, and Gerald J. Popek. Simplifying automated hoarding methods. In *Proceedings of the Fifth ACM International Workshop on Modeling, Analysis and Simulation of Wireless and Mobile Systems*, Atlanta, Georgia, September 2002. ACM.
- [30] Alexey Rudenko, Peter Reiher, Gerald Popek, and Geoffrey H. Kuenning. The remote processing framework for portable computer power saving. In *Proceedings of the ACM Symposium on Applied Computing*, San Antonio, TX, February 1999. ACM.
- [31] Geoffrey H. Kuenning, Rajive Bagrodia, Richard G. Guy, Gerald J. Popek, Peter Reiher, and An-I Wang. Measuring the quality of service of optimistic replication. In *ECOOP Workshop on Mobility and Replication*, Brussels, Belgium, July 1998.
- [32] Geoffrey H. Kuenning and Gerald J. Popek. Automated hoarding for mobile computers. In *Proceedings of the 16th Symposium on Operating Systems Principles*, pages 264–275, St. Malo, France, October 1997. ACM.
- [33] Geoffrey H. Kuenning. The design of the SEER predictive caching system. In *Proceedings of the Workshop on Mobile Computing Systems and Applications*, Santa Cruz, CA, December 1994.
- [34] Geoffrey H. Kuenning, Gerald J. Popek, and Peter Reiher. An analysis of trace data for predictive file caching in mobile computing. In *USENIX Conference Proceedings*, pages 291–306. USENIX Association, June 1994.

#### Books and Book Chapters

- [1] Christine Alvarado, Zachary Dodds, Geoff Kuenning, and Ran Libeskind-Hadas. *CS for All*. Franklin, Beedle, 2019.
- [2] Christine Alvarado, Zachary Dodds, Geoff Kuenning, and Ran Libeskind-Hadas. CS for scientists and engineers. Unpublished manuscript, March 2012.
- [3] An-I Andy Wang, Geoffrey H. Kuenning, and Peter Reiher. Multipath routing in ad hoc networks. In Kia Makki, Niki Pissinou, Kami Makki, and E. K. Park, editors, *Mobile and Wireless Internet: Protocols, Algorithms and Systems*, chapter 10, pages 245–262. Kluwer Academic Publishers, Boston, 2003.
- [4] Geoffrey H. Kuenning. Real-time Unix. In Mitchell Waite, editor, *Unix Papers for Unix Developers and Power Users*. Howard W. Sams & Co., 1987.

#### Other

- [1] Jazmin Ortiz, Elizabeth Krenkel, Emily Dorsey, and Geoff Kuenning. Frequency-based block re-ordering. Poster and Work-in-Progress Report presented at the Workshop on Supporting Diversity in Systems Research, October 2015.

- [2] Ming Chen, Dean Hildebrand, Geoff Kuenning, Soujanya Shankaranarayana, Bharat Sing, and Erez Zadok. Is NFSv4.1 ready for prime time? *;login.*, 40(3):6–12, June 2015.
- [3] Geoff Kuenning. On teaching style and maintainability. *;login.*, 38(3):6–9, June 2013.
- [4] Linda Werner, Geoff Kuenning, Mark Sebern, Jim Vallino, and Eric Wong. Software engineering education via the use of corporate-sponsored projects: A panel discussion of the approaches, benefits, and challenges for industry-academic collaboration. Panel session at the 26th Conference on Software Engineering and Training, May 2013.
- [5] Peter Reiher, Jun Li, and Geoff Kuenning. Midgard worms: Sudden nasty surprises from a large resilient zombie army. Technical Report UCLA-CSD-040019, University of California, Los Angeles, Computer Science Department, Los Angeles, CA, April 2004.
- [6] Geoff Kuenning and Ethan L. Miller. Anonymization techniques for URLs and filenames. Technical report UCSC-CRL-03-05, Storage Systems Research Center, Jack Baskin School of Engineering, University of California, Santa Cruz, Santa Cruz, California, September 2003.
- [7] An-I Andy Wang, Geoffrey H. Kuenning, Peter Reiher, and Gerald J. Popek. The Conquest file system—life after disks (position summary). In *Proceedings of the 8th Workshop on Hot Topics in Operating Systems*, Schloß Elmau, Germany, May 2001. IEEE.
- [8] Geoffrey H. Kuenning. A cron daemon for portable computers. Technical Report UCLA-CSD-990044, University of California, Los Angeles, Los Angeles, CA, September 1999.
- [9] Geoffrey H. Kuenning, David H. Ratner, Peter Reiher, Gerald J. Popek, and Richard G. Guy. Co-operative chaos. Technical Report UCLA-CSD-970041, University of California, Los Angeles, Los Angeles, CA, November 1997.
- [10] Geoffrey Houston Kuenning. *Seer: Predictive File Hoarding for Disconnected Mobile Operation*. PhD thesis, University of California, Los Angeles, Los Angeles, CA, May 1997. Also available as UCLA CSD Technical Report UCLA-CSD-970015.
- [11] David Ratner, Peter Reiher, Gerald J. Popek, and Geoffrey H. Kuenning. Replication requirements in mobile environments. Presented at the First Dial M for Mobility, October 1997.
- [12] Geoffrey H. Kuenning. A minimal multitasking operating system for real-time controllers. *SIGSMALL Newsletter*, 7(2), October 1981.
- [13] Geoffrey H. Kuenning. Designing real-time software systems. *SIGSMALL Newsletter*, 7(2), October 1981.

## References

Available upon request