EREZ ZADOK, CURRICULUM VITAE

Erez Zadok
Computer Science Department
349 New Computer Science
Stony Brook University
Stony Brook, NY 11794-2424

Phone: +1 631 632 8461 (office)
Fax: +1 631 632 8243
Timezone: US/Eastern
Email: ezk@cs.stonybrook.edu
Web: https://www.cs.sunysb.edu/~ezk

RESEARCH INTERESTS

Operating systems with a special focus on file systems, storage, clouds, big data, hardware/architecture, encryption, security, benchmarking, performance analysis and optimization, energy efficiency, and system administration.

EDUCATION

May 2001 Ph.D., Computer Science, Columbia University, New York, NY,
FiST: A System for Stackable File-System Code Generation.

Sep 1997 M.Phil., Computer Science, Columbia University, New York, NY

Oct 1994 M.S., Computer Science, Columbia University, New York, NY
Discovery and Hot Replacement of Replicated Read-Only File Systems, with Application to Mobile Computing

May 1991 B.S., Computer Science, Columbia University, New York, NY

May 1982 Certified Technician, Electrical Engineering, Holtz College, Israel

PROFESSIONAL EXPERIENCE

Aug 2017–present	Graduate Academic Adviser, Computer Science Department, Stony Brook University
Jan 2016–present	Professor, Computer Science Department, Stony Brook University
Jan 2007–2015	Associate Professor, Computer Science Department, Stony Brook University
Jan 2001–Jan 2007	Assistant Professor, Computer Science Department, Stony Brook University
2013–present	Director, Smart Energy Technologies (SET) Faculty Cluster, Stony Brook University
2024–present	Technical Expert; K&L Gates, LLP.
2023–present	Technical Expert; Orrick, Herrington & Sutcliffe, LLP.
2023–present	Technical Expert; Paul Hastings LLP
2023–present	Technical Expert; Desmarais, LLP
2023–present	Technical Expert; Smith Baluch LLP
2022–present	Technical Expert; Faegre Drinker Biddle & Reath LLP
2022	Technical Expert; Rothwell, Figg, Ernst & Manbeck, P.C.
2022	Technical Expert; Unified Patents, LLC
2022–present	Technical Expert; Latham & Watkins, LLP
2021–present	Technical Expert; King & Spalding LLP.

2021–2022	Technical Expert; Wilson Sonsini Goodrich & Rosati (WSGR) LLP.
2021–2022	Technical Expert; Perkins Coie LLP
2021–2022	Technical Expert; Morrison & Forester, LLP.
2021–2022	Technical Expert; Jones Day, LLP.
2021–2022	Technical Expert; Orrick, Herrington & Sutcliffe, LLP.
2021	Technical Expert; Fasken Martineau DuMoulin LLP
2020	Technical Expert; United States Attorney's Office, Eastern District of New York
2020	Technical Expert; Latham & Watkins, LLP
2020	Technical Expert; Morgan Lewis & Bockius LLP
2020–2021	Technical Expert; Covington & Burling, LLP
2019–2020	Technical Expert; Quinn Emanuel Urquhart & Sullivan, LLP
2019	Technical Expert; Hogan Lovells LLP.
2018–2020	Technical Expert; King & Spalding LLP.
2018–2019	Technical Expert; Orrick, Herrington & Sutcliffe, LLP.
2017–2018	Technical Expert; Weil, Gotshal & Manges LLP.
2017–2019	Technical Expert; Keker, Van Nest, & Peters LLP.
2016–2018	Technical Expert; Sterne, Kessler, Goldstein & Fox, P.L.L.C.
2015–2018	Technical Expert; Wilmer Cutler Pickering Hale and Dorr LLP. (WilmerHale)
2015–2017	Technical Expert; Ropes & Gray, LLP.
2014–2015	Technical Expert; Foley & Lardner, LLP.
2014–2016	Technical Expert; Latham & Watkins, LLP.
2014–2016	Technical Expert; Keker & Van Nest, LLP.
2013–present	Managing Member; Zadoks Consulting, LLC.
2013–2014	Technical Expert; Sterne, Kessler, Goldstein & Fox, P.L.L.C.
2013	Technical Expert; Akin, Gump, Strauss, Hauer & Feld, LLP.
2012–2015	Technical Expert; Susman Godfrey, LLP.
2012–2013	Technical Expert; Fish Richardson, LLP.
2010–2011	Technical Expert; Sughrue Mion, LLP.
2010	Technical Expert; One LLP.
2009–2010	Consultant; CTERA Networks, Inc.
2009–2019	Consultant; Packet General Networks, Inc.
2006–2007	Technical Expert; Hennigan, Bennett, and Dorman, LLP.

1991–2000	Graduate Research Assistant, Computer Science Department, Columbia University
1999–2000	Director of Software Development, HydraWEB Technologies, Inc.
1994–1998	Project Leader, HydraWEB Technologies, Inc.
1990–1998	Consultant, SOS Corporation
1997	Manager of Computing Facilities, Computer Science Department, Columbia University
1991–1998	Technical Staff Member, Computer Science Department, Columbia University
1989–1991	Assistant Lab Manager, Academic Information Systems, Columbia University
1987–1989	Student Consultant, Academic Information Systems, Columbia University
1984–1986	National Army Service, Israeli Air Force, Israel
1982–1984	Programmer, Commodore Israel, Tel-Aviv, Israel
1981–1984	Computer Lab Manager, Holtz College, Tel-Aviv, Israel

PERSONAL

Born December 4, 1964, Tel-Aviv, Israel.

Married, one child.

Citizenships: U.S.A and Israel

Fluent in English and Hebrew

Member: ACM, ACM SIGOPS, IEEE, IEEE Computer Society, USENIX

Affiliate: Storage Systems Research Center (SSRC), Jack Baskin School of Engineering, University of California, Santa Cruz, California.

Member: The I/O Traces, Tools and Analysis (IOTTA) Technical Work Group (TWG), part of the the Storage Networking Industry Association (SNIA).

FUNDING

Oct 2022–present	*CNS Core: Large: Systems and Verifiable Metrics for Sustainable Data Centers*. NSF. $1,500,000 (SBU share $928,403), 4 years. Co-PI with four other SBU faculty, collaborative with Binghamton University and Penn State University.
Oct 2022–present	*Collaborative Research: CyberTraining: Implementation: Medium: FOUNT: Scaffolded, Hands-On Learning for a Data-Centric Future*. NSF. $996,548 (SBU share $174,905), 3 years. Sole PI at SBU. Collaborative with U. Chicago (lead), NYU, Northern Illinois U., and UC San Diego (6 collaborators total).
2022	*CNS Core: Medium: Optimizing Storage Caches via Adaptive and Reconfigurable Tiering*. NSF Research Experiences for Undergraduates (REU) supplement. $16,000. Lead-PI with one other SBU faculty, collaborative with Emory University.
2022	*SCC-IRG Track 1: Smart Aging: Connecting Communities Using Low-Cost and Secure Sensing Technologies*. NSF Research Experiences for Undergraduates (REU) supplement. $24,000. Co-PI with four other SBU faculty.

HULU EXHIBIT 1003
Page 3 of 73

2022	*CNS Core: Medium: Optimizing Storage Caches via Adaptive and Reconfigurable Tiering*. NSF Research Experiences for Undergraduates (REU) supplement. $16,000. Lead-PI with one other SBU faculty, collaborative with Emory University.
2022	*CNS Core: III: Medium: Collaborative Research: Optimizing and Understanding Large Parameter Spaces in Storage Systems*. NSF Research Experiences for Undergraduates (REU) supplement. $16,000. Lead PI with one other.
Oct 2021–present	*CNS Core: Medium: Optimizing Storage Caches via Adaptive and Reconfigurable Tiering*. NSF. $800,000 (SBU share $533,333), 3 years. Lead-PI with one other SBU faculty, collaborative with Emory University.
Oct 2021–present	*CNS Core: Medium: Secure, Reliable, and Efficient Long-Term Storage*. NSF. $1,198,842 (SBU share $717,303), 4 years. Lead-PI with one other SBU faculty, collaborative with UC Santa Cruz.
2021–2022	*Kubernetes/Containerizations on GPU Clusters for AI*. SUNY-IBM AI Collaborative Research Alliance. $100,000. Co-PI with two others.
2020–2021	*Automated Cross-Validation of TLS 1.3 Implementations*. Facebook Faculty Research Award. $50,000. Lead PI with two others.
Oct 2020–present	*SCC-IRG Track 1: Smart Aging: Connecting Communities Using Low-Cost and Secure Sensing Technologies*. NSF Smart and Connected Communities. $1,700,126, 4 years. Co-PI with four other SBU faculty.
Sep 2020–present	*Recruitment and Retention of Women Undergraduates*. Center for Inclusive Computing Diversity Initiative, by Northeastern University and Pivotal Ventures. $295,742, 4 years. Co-PI with four other SBU faculty.
2020	*FMitF: Track I: NLP-Assisted Formal Verification of the NFS Distributed File System Protocol*. NSF Research Experiences for Undergraduates (REU) supplement. $16,000. Lead PI with two others.
2020	*CNS Core: III: Medium: Collaborative Research: Optimizing and Understanding Large Parameter Spaces in Storage Systems*. NSF Research Experiences for Undergraduates (REU) supplement. $8,000. Lead PI with one other.
Oct 2019–present	*CNS Core: III: Medium: Collaborative Research: Optimizing and Understanding Large Parameter Spaces in Storage Systems* NSF. $1,088,017 (SBU share $823,142), 4 years. Lead-PI with one other SBU faculty, collaborative with Harvey Mudd College.
Oct 2019–present	*FMitF: Track I: NLP-Assisted Formal Verification of the NFS Distributed File System Protocol* NSF. $748,300, 3 years. Lead-PI with two other SBU faculty.
2019	*CI-SUSTAIN: National File System Trace Repository*. NSF Research Experiences for Undergraduates (REU) supplement. $8,000. Sole PI.
2019	*Study of a Novel Non-Wearable Respiration and Heart Rate Sensor in Cardiopulmonary Exercise Testing*. Stony Brook College of Engineering and Applied Sciences, SEED grant. $15,000, Co-PI with five others.
2019	*Realizing the Full Performance and Parallelization Potential of Modern Storage Architectures for Big Data Applications*. Stony Brook Research Foundation,

	SEED grant. $60,000, Co-PI with Anshul Gandhi.
2018	*Storage/Deduplication research*. Dell-EMC Corporation. $25,000, Single PI.
Jun 2017–present	*CI-SUSTAIN: National File System Trace Repository*. NSF. $129,867 (SBU share), 3 years. Co-PI with lead institution Harvey Mudd College.
2017–2022	*I/UCRC Phase II: Center for Visual and Decision Informatics (CVDI) Site at SUNY Stony Brook*. NSF. $400,000, 4 years. Co-PI with A. Kaufman, K. Mueller, H. Schwartz, and D. Samaras.
2017	Dell-EMC Corporation. *Storage/Deduplication research*, $25,000, Single PI.
2016–2021	*NRT-DESE: Interdisciplinary Graduate Training to Understand and Inform Decision Processes Using Advanced Spatial Data Analysis and Visualization (STRIDE)*. NSF. $2,993,930, 5 years. Senior personnel.
2016–2019	*Early Detection of User-impersonating Attackers using Multilayer Tripwires*, U.S. Office of Naval Research (ONR). $586,215, 3 years. Co-PI with Nick Nikiforakis.
Jun 2016–2019	*EAGER: Elastic Multi-layer Memcached Tiers* NSF. $257,165, 2 years. Co-PI with Anshul Gandhi.
2016	EMC Corporation. *Storage/Deduplication research*, $25,000, Single PI.
2015	EMC Corporation. *Storage/Deduplication research*, $25,000, Single PI.
Feb 2015	*Student Travel Support for the 13th USENIX Conference on File and Storage Technologies (FAST 2015)*. NSF. $20,000, 1 year. Sole PI.
Sep 2014–2017	*Adaptive Runtime Verification and Recovery for Mission-Critical Software*. U.S. Air Force Office of Scientific Research (AFOSR). $620,861, 3 years. Co-PI with Scott A. Smolka and Scott D. Stoller. (Collaboration with NASA JPL.)
Jan 2014–2016	*Smarter Electric Grid Research, Innovation, Development, Demonstration, Deployment Center (SGRID3)*. Brookhaven Science Associates LLC (BNL), $236,397, 1 year. Lead-PI with one other Stony Brook Co-PI.
2014	EMC Corporation. *Storage/Deduplication research*, $25,000, Sole PI.
Jun 2013–2017	*CSR: Medium: Collaborative Research: Workload-Aware Storage Architectures for Optimal Performance and Energy Efficiency*. NSF. $513,900 (SBU share, total budget $1,000,000), 3 years. Lead-PI with one other Stony Brook Co-PI, and two more institutions (Harvard U. and Harvey Mudd College).
Jan 2013–2017	*BIGDATA: Small: DCM: Collaborative Research: An efficient, versatile, scalable, and portable storage system for scientific data containers*. NSF. $444,267 (SBU share, total budget $746,290), 3 years. Lead-PI with two other Stony Brook Co-PIs, and two more institutions (Brandeis U. and Louisiana State U.).
Sep 2013–2017	*CRI-CI-ADDO-EN: National File System Trace Repository*. NSF. $37,018 (SBU share, total budget $167,817), 3 years. Co-PI with lead institution Harvey Mudd College.
2013	Western Digital Research award. *Shingled Magnetic Recording Disks Benchmarking*, $50,000, Single PI.

Sep 2012 – 2016	*NFS4Sec: An Extensible Security Layer for Network Storage*. NSF. $486,783, 3 years. Lead-PI with one other Co-PI.
2012-2013	*Server-Class Performance vs. Energy Optimizations*. Government of Israel (GoI), Mission to the USA. $47,152, 1 year. Lead PI with one other Co-PI.
2011	NetApp Research award. *Dedup Workload Modeling, Synthetic Datasets, and Scalable Benchmarking*, $40,000, Single PI.
2010	NetApp Research award. *A Study of Network Storage Benefits using FLASH Hardware with Indexing Workloads*, $40,000, Single PI.
Nov 2010 – 2016	*Long Island Smart Energy Corridor*. Department of Energy (DOE), LIPA, and New York State. Collaboration between Stony Brook University, SUNY Farmingdale, and LIPA. $2,822,638, Co-PI.
Sep 2009 – Aug 2013	*Collaborative Research: Performance- and Energy-Aware HEC Storage Stacks*. NSF. $652,000, 3 years. Co-PI with Geoff Kuenning (Harvey Mudd College)
Sep 2009 – Aug 2013	*Collaborative Research: Secure Provenance in High End Computing Systems*. NSF. $564,972, 3 years. Co-PI with Radu Sion. Collaborative project with Patrick McDaniel (Penn State U.) and Marianne Winslett (UIUC).
Apr 2009 – Nov 2012	*Survivable Software*. U.S. Air Force Office of Scientific Research (AFOSR). $881,691, 39 months. Co-PI with Scott A. Smolka, Radu Grosu, Scott D. Stoller, and Klaus Havelund (NASA JPL).
Feb 2010	*Student Travel Support for the First USENIX Workshop on Sustainable Information Technology (SustainIT 2010)*. NSF. $10,000, 1 year. Lead PI.
2009	Network Appliance Research award. *Power use in Storage Servers.* $30,000 Single PI.
2008	*The Impact of Storage Software and Aging on Power Consumption*, **IBM Faculty award** (IBM T.J. Watson Labs). $20,000, one year. Single PI.
2008	Network Appliance Equipment gift. *A Study of User File Access Patterns.* $91,083 Single PI.
Sep 2007 – 2015	*Center for Information Protection: A Multi-University Industry/University Collaborative Research Center*. NSF. $250,147, 5 years. Co-PI with R. Sekar (PI), Tzi-Cker Chiueh, Scott Stoller, and Radu Sion.
Sep 2006 – Aug 2009	*CT-ISG: N3S: Networked Secure Searchable Storage with Privacy and Correctness Assurances*. NSF. $300,000, 3 years. Co-PI with Radu Sion.
Aug 2006 – Aug 2010	*File System Tracing, Replaying, Profiling, and Analysis on HEC Systems*. NSF. $760,252, 3 years. Lead PI with Klaus Mueller (Stony Brook) and Ethan Miller (UC Santa Cruz).
Jul 2006	*End-to-End File Server Security*, **IBM Faculty award** (IBM Haifa Research Labs). $20,000, one year. Single PI.
Jun 2006 – Aug 2010	*CSR—PDOS: Support for Atomic Sequences of File System Operations*. NSF. $561,727, 3 years. Lead PI with Margo Seltzer (Harvard University).

HULU EXHIBIT 1003
Page 6 of 73

Jan 2006 – Dec 2006	*Secure File Systems*, NY State "Millennium" award, $204,528, one year. Co-PI with R. Sekar (PI), Tzi-Cker Chiueh, CR Ramakrishnan, Radu Sion, and Scott D. Stoller.
Jul 2005 – Aug 2010	*CSR—AES: Runtime-Monitoring and Model Checking for High-Confidence Systems Software*. NSF. $830,000, 4 years. Lead PI with Radu Grosu, Y. Annie Liu, Scott Smolka, and Scott D. Stoller.
Sep 2005 – Aug 2004	*I/UCRC: A Plan for Developing a Multi-University Industry/University Collaborative Research Center on Cyber Security*. NSF. $9,987, one year. Co-PI with R. Sekar, Radu Sion Scott D. Stoller, and Tzi-Cker Chiueh.
Sep 2004 – Aug 2009	*Federal Cyber Service: Scholarship for Service (SFS)*. NSF. $2,459,061, 4 years. Co-PI with R. Sekar, Scott D. Stoller, I. V. Ramakrishnan, and Tzi-Cker Chiueh.
Sep 2003 – Aug 2008	*A Layered Approach to Securing Network File Systems*. NSF Trusted Computing Program (TC). $400,000, 3 years. Single PI.
Sep 2003 – Aug 2005	*Collaborative Research: Capacity Expansion in Information Assurance*. NSF Collaborative Research Proposal (CAP). $199,883, 2 years. Co-PI with R. Sekar, Scott D. Stoller, and I. V. Ramakrishnan.
Sep 2002 – Aug 2007	**CAREER**: *An In-Kernel Runtime Execution Environment for User-Level Programs.* NSF Next Generation Software Program (NGS). $400,000, 5 years. Single PI.
Jan 2003 – Dec 2003	*Assessing the Technological Basis for Enterprise Protection*, NIJ (CyberScience Lab) CSL. $90,563, one year. Co-PI with R. Sekar, Tzi-cker Chiueh, and Scott D. Stoller.
Sep 2002 – May 2003	New York State Strategic Partnership for Industrial Resurgence (SPIR), with Packet General Networks. *S3: Secure Shared Storage.* $94,581. Single PI.
May 2002 – Aug 2002	New York State Strategic Partnership for Industrial Resurgence (SPIR), with Packet General Networks. *A Secure and Scalable Network Appliance.* $55,676. Single PI.
Apr 2003	Microsoft Tablet PC Seed Award. $4,169. Single PI.
2002	HP/Intel IA-64/IPF Second Generation Equipment gift. *Linux Application Performance and File System Security.* $131,529. Single PI.
2001	HP/Intel IA-64/IPF Equipment gift. *Linux Network Scalability and File System Reliability.* $22,490. Single PI.
2001	Red Hat University software award.

AWARDS AND HONORS

2023 Best paper award. A. Merenstein, V. Tarasov, A. Anwar, S. Guthridge, and E. Zadok. F3: Serving Files Efficiently in Serverless Computing. In Proceedings of the 16th ACM International Systems and Storage Conference (SYSTOR '23).

2023 Elected as IEEE Senior Member

2021–2022 Chancellor's Award for Excellence in Scholarship and Creative Activities, State University of New York (SUNY).

2022 Provost's Excellent Mentor award, Stony Brook University.

2021 Elected as ACM Distinguished Member for "Outstanding Scientific Contributions to Computing."

2021 Dean's "Millionaire" award (given lead PIs who secure more than one-million dollars of new funding in a given year), College of Engineering and Applied Sciences, Stony Brook University.

2020 Inducted as member of the Stony Brook University Chapter of the National Academy of Inventors (NAI).

2020 Best paper award. M. Wajahat, A. Yele, T. Estro, A. Gandhi, and E. Zadok. Distribution fitting and performance modeling for storage traces. In 27th IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2019).

2019 Dean's "Millionaire" award (given lead PIs who secure more than one-million dollars of new funding in a given year), College of Engineering and Applied Sciences, Stony Brook University.

Sep 2011 Best Paper Award. S. D. Stoller and E. Bartocci and J. Seyster and R. Grosu and K. Havelund and S. A. Smolka and E. Zadok. Runtime verification with state estimation. In proceedings of the 2nd International Conference on Runtime Verification (RV'11).

Dec 2009 LISTnet's "Top 20 techies of Long Island" award.

Aug 2008 Service Award (for 2006–2008), Stony Brook University, Computer Science Department

2008 IBM Faculty award (IBM T.J. Watson Labs)

2007–2008 Chancellor's Award for Excellence in Teaching, State University of New York (SUNY).

2007–2008 President's Award for Excellence in Teaching, Stony Brook University.

Aug 2006 Research Excellence Award (for 2005–2006), Stony Brook University, Computer Science Department

Jul 2006 IBM Faculty award (IBM Haifa Research Labs)

Nov 2005 Best Short Paper Award. N. Joukov, A. Kashyap, G. Sivathanu, E. Zadok. Kefence: An Electric Fence for Kernel Buffers. In proceedings of the first ACM International Workshop on Storage Security and Survivability (StorageSS 2005), "The Paradigm Shift to Info-Centric Protection," held in conjunction with the 12th ACM Conference on Computer and Communications Security (CCS 2005).

May 2005 Best Paper Award. N. Joukov, A. Rai, and E. Zadok. Increasing Distributed Storage Survivability with a Stackable RAID-like File System. In proceedings of the 2005 IEEE/ACM Workshop on Cluster Security, in conjunction with the Fifth IEEE/ACM International Symposium on Cluster Computing and the Grid (CCGrid).

Aug 2004 Graduate Teaching and Research Award (for 2003–2004), Stony Brook University, Computer Science Department

May 2003 Promising Inventor Award, The State University of New York, Research Foundation

Sep 2002 NSF CAREER award, National Science Foundation

Jun 2001 Best Student Paper. M. G. Schultz, E. Eskin, E. Zadok, M. Bhattacharyya, and S. J. Stolfo. MEF: Malicious Email Filter — A UNIX Mail Filter that Detects Malicious Windows Executables.

HULU EXHIBIT 1003
Page 8 of 73

In *Proceedings of the Annual USENIX Technical Conference, FreeNIX Track*, pages 245–252, JUNE 2001.

Jun 2000 Usenix Student Stipend award

Jun 1999 Usenix Student Stipend award

1991 Dean's List

1991 NCR Best Undergraduate Research Award

1989–1990 Gussman Scholar

1988–1989 National Dean's List

1988–1989 Scheuer Foundation Presidential Scholar

1988 Dean's List

PUBLICATIONS

Books

E. Zadok. *Linux NFS and Automounter Administration*. Sybex, Inc., May 2001.

Journal and Magazine Articles

Tyler Estro, Mário Antunes, Pranav Bhandari, Anshul Gandhi, Geoff Kuenning, Yifei Liu, Carl Waldspurger, Avani Wildani, and Erez Zadok. Accelerating multi-tier storage cache simulations using knee detection. *Performance Evaluation*, 164:102410, May 2024.

S. Hussain, P. McDaniel, A. Gandhi, K. Ghose, K. Gopalan, D. Lee, Y. Liu, Z. Liu, S. Mu, and E. Zadok. Verifiable sustainability in data centers. *IEEE Security & Privacy*, (01):2–15, March 2024.

Anshul Gandhi, Dongyoon Lee, Zhenhua Liu, Shuai Mu, Erez Zadok, Kanad Ghose, Kartik Gopalan, Yu David Liu, Syed Rafiul Hussain, and Patrick Mcdaniel. Metrics for sustainability in data centers. *SIGENERGY Energy Inform. Rev.*, 3(3):40–46, oct 2023.

Ibrahim "Umit" Akgun, Ali Selman Aydin, Andrew Burford, Michael McNeill, Michael Arkhangelskiy, and Erez Zadok. Improving storage systems using machine learning. *ACM Transactions on Storage (TOS)*, 19(1):1–30, Jan 2023.

Erez Zadok and Ada Gavrilovska. Running virtual pc (cpc) meetings. *;login: The USENIX Magazine*, 45(2):54–56, July 2020.

Muhammad Wajahat, Aditya Yele, Tyler Estro, Anshul Gandhi, and Erez Zadok. Analyzing the distribution fit for storage workload and internet traffic traces. *Performance Evaluation*, pages 102–121, 2020.

George Amvrosiadis, Ali R. Butt, Vasily Tarasov, Erez Zadok, and Ming Zhao. Selected results of the workshop on data storage research 2025. *;login: The USENIX Magazine*, 44(4):24–28, December 2019.

Bharath Kumar Reddy Vangoor, Prafful Agarwal, Manu Mathew, Arun Ramachandran, Swaminathan Sivaraman, Vasily Tarasov, and Erez Zadok. Performance and resource utilization of FUSE user-space file systems. *ACM Transactions on Storage (TOS)*, 15(2), May 2019.

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 (TOS)*, 14(2), May 2018.

Ming Chen, Geetika Bangera, 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 (TOS)*, 13(7), September 2017.

Vasily Tarasov, Erez Zadok, and Spencer Shepler. Filebench: A flexible framework for file system benchmarking. *;login: The USENIX Magazine*, 41(1):6–12, March 2016.

Z. Li, M. Chen, A. Mukker, and E. Zadok. On the trade-offs among performance, energy, and endurance in a versatile hybrid drive. *ACM Transactions on Storage (TOS)*, 11(3), July 2015.

Ming Chen, Dean Hildebrand, Geoff Kuenning, Soujanya Shankaranarayana, Bharat Singh, and Erez Zadok. Is NFSv4.1 ready for prime time? *;login: The USENIX Magazine*, 40(3):6–12, June 2015.

Zhiyuan Zhang, Kevin T. McDonnell, Erez Zadok, and Klaus Mueller. Visual correlation analysis of numerical and categorical data on the correlation map. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 21(2), February 2015.

Michael A. Bender, Martin Farach-Colton, Rob Johnson, Russell Kraner, Bradley C. Kuszmaul, Dzejla Medjedovic, Pablo Montes, Pradeep Shetty, Richard P. Spillane, and Erez Zadok. Don't thrash: How to cache your hash on flash. 5(11):1627–1637, August 2012.

J. Seyster, K. Dixit, X. Huang, R. Grosu, K. Havelund, S. A. Smolka, S. D. Stoller, and E. Zadok. InterAspect: Aspect-oriented instrumentation with GCC. *Formal Methods in System Design*, August 2012.

X. Huang, J. Seyster, S. Callanan, K. Dixit, R. Grosu, S. A. Smolka, S. D. Stoller, and E. Zadok. Software monitoring with controllable overhead. *International Journal on Software Tools for Technology Transfer (STTT)*, 14(3):327–347, 2012.

Priya Sehgal, Vasily Tarasov, and Erez Zadok. Optimizing energy and performance for server-class file system workloads. *ACM Transactions on Storage (TOS)*, 6(3), September 2010.

E. Zadok, V. Tarasov, and P. Sehgal. The case for specialized file systems, or, fighting file system obesity. *;login: The USENIX Magazine*, 35(1):38–40, February 2010.

M. T. Dougherty, M. J. Folk, E. Zadok, H. J. Bernstein, F. C. Bernstein, K. W. Eliceiri, W. Benger, and C. Best. Unifying biological image formats with hdf5. *Communications of the ACM (CACM)*, 52(10):42–47, October 2009.

A. Traeger and E. Zadok. Notes on a nine year study of file system and storage benchmarking. *Byte and Switch*, July 2009. www.byteandswitch.com/storage/storage-management/notes-on-a-nine-year-study-of-file-system-and-storage-benchmarking.php.

A. Traeger, E. Zadok, E. L. Miller, and D. D. E. Long. Findings from the first annual storage and file systems benchmarking workshop. *;login: The USENIX Magazine*, 33(5):113–117, October 2008.

Avishay Traeger, Erez Zadok, Nikolai Joukov, and Charles P. Wright. A nine year study of file system and storage benchmarking. *ACM Transactions on Storage (TOS)*, 4(2):25–80, May 2008.

C. P. Wright, R. Spillane, G. Sivathanu, and E. Zadok. Extending ACID semantics to the file system. *ACM Transactions on Storage (TOS)*, 3(2):1–42, June 2007.

HULU EXHIBIT 1003
Page 10 of 73

Erez Zadok, Rakesh Iyer, Nikolai Joukov, Gopalan Sivathanu, and Charles P. Wright. On incremental file system development. *ACM Transactions on Storage (TOS)*, 2(2):161–196, 2006.

C. P. Wright, J. Dave, P. Gupta, H. Krishnan, D. P. Quigley, E. Zadok, and M. N. Zubair. Versatility and unix semantics in namespace unification. *ACM Transactions on Storage (TOS)*, 2(1):1–32, February 2006.

C. P. Wright and E. Zadok. Unionfs: Bringing file systems together. *Linux Journal*, 2004(128):24–29, December 2004.

E. Zadok. Using the Amd automounter. *Linux Journal*, 10(114):52–55, October 2003.

E. Zadok. Writing stackable file systems. *Linux Journal*, 05(109):22–25, May 2003.

W. Lee, W. Fan, M. Miller, S. Stolfo, and E. Zadok. Toward cost-sensitive modeling for intrusion detection and response. *Journal of Computer Security*, 10(1–2):5–22, January 2002.

Refereed Conference and Workshop Papers

Debajyoti Halder, Manas Acharya, Aniket Malsane, Anshul Gandhi, and Erez Zadok. Empirical evaluation of ML models for per-job power prediction. In *Proceedings of the 7th ICPE Workshop on Hot Topics in Cloud Computing Performance (HotCloudPerf 2024)*, London, UK, May 2024. ACM. To appear.

Yifei Liu, Manish Adkar, Gerard Holzmann, Geoff Kuenning, Pei Liu, Scott Smolka, Wei Su, and Erez Zadok. Metis: File system model checking via versatile input and state exploration. In *Proceedings of the 22nd USENIX Conference on File and Storage Technologies (FAST '24)*, Santa Clara, CA, February 2024. USENIX Association. Received all 3 Artifact-Evaluation badges.

Tyler Estro, Mario Antunes, Pranav Bhandari, Anshul Gandhi, Geoff Kuenning, Yifei Liu, Carl Waldspurger, Avani Wildani, and Erez Zadok. Guiding simulations of multi-tier storage caches using knee detection. In *31st Annual International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunications Systems (MASCOTS '23)*, Stony Brook, NY, October 2023. IEEE Computer Society.

Peter Desnoyers, Andy Rudoff, Ian Adams, Tyler Estro, Anshul Gandhi, Geoff Kuenning, Mike Mesnier, Carl Waldspurger, Avani Wildani, and Erez Zadok. Persistent memory research in the post-optane era. In *1st Workshop on Disruptive Memory Systems (DIMES 2023)*, October 2023. https://dl.acm.org/doi/10.1145/3609308.3625268.

Yifei Liu, Gautam Ahuja, Geoff Kuenning, Scott Smolka, and Erez Zadok. Input and output coverage needed in file system testing. In *Proceedings of the 15th ACM Workshop on Hot Topics in Storage and File Systems (HotStorage '23)*, Boston, MA, July 2023. ACM.

Alex Merenstein, Vasily Tarasov, Ali Anwar, Scott Guthridge, and Erez Zadok. F3: Serving files efficiently in serverless computing. In *Proceedings of the 16th ACM International Systems and Storage Conference (SYSTOR '23)*, Haifa, Israel, June 2023. ACM. Won Best Paper Award.

Ibrahim "Umit" Akgun, Santiago Vargas, Michael Arkhangelskiy, Andrew Burford, Michael McNeill, Aruna Balasubramanian, Anshul Gandhi, and Erez Zadok. Predicting network buffer capacity for BBR fairness. In *36th Conference on Neural Information Processing Systems (NeurIPS 2022) Workshop on ML for Systems*, December 2022.

Anjul Tyagi, Tyler Estro, Geoff Kuenning, Erez Zadok, and Klaus Mueller. PC-Expo: A metrics-based interactive axes reordering method for parallel coordinate displays. *IEEE Transactions on Visualization and Computer Graphics*, October 2022.

Anshul Gandhi, Kanad Ghose, Kartik Gopalan, Syed Hussain, Dongyoon Lee, David Liu, Zhenhua Liu, Patrick McDaniel, Shuai Mu, and Erez Zadok. Metrics for sustainability in data centers. In *Proceedings of the 1st Workshop on Sustainable Computer Systems Design and Implementation (HotCarbon'22)*, San Diego, CA, USA, July 2022. USENIX.

Sayontan Ghosh, Amanpreet Singh, Meyer "Alex" Merenstein, Wei Su, Scott A. Smolka, Erez Zadok, and Niranjan Balasubramanian. SpecNFS: A challenge dataset towards extracting formal models from natural language specifications. In *Proceedings of the 13th Language Resources and Evaluation Conference (LREC'22)*, pages 2166–2176, Marseille, France, June 2022.

Wei Su, Yifei Liu, Gomathi Ganesan, Gerard Holzmann, Scott Smolka, Erez Zadok, and Geoff Kuenning. Model-checking support for file system development. In *Proceedings of the 13th ACM Workshop on Hot Topics in Storage and File Systems (HotStorage '21)*, pages 103–110, Virtual, July 2021. ACM.

Ibrahim 'Umit' Akgun, Ali Selman Aydin, Aadil Shaikh, Lukas Velikov, and Erez Zadok. A machine learning framework to improve storage system performance. In *Proceedings of the 13th ACM Workshop on Hot Topics in Storage and File Systems (HotStorage '21)*, Virtual, July 2021. ACM.

Alex Merenstein, Vasily Tarasov, Ali Anwar, Deepavali Bhagwat, Julie Lee, Lukas Rupprecht, Dimitris Skourtis, Yang Yang, and Erez Zadok. CNSBench: A cloud native storage benchmark native storage. In *Proceedings of the 19th USENIX Conference on File and Storage Technologies (FAST '21)*, Virtual, February 2021. USENIX Association.

Alex Merenstein, Vasily Tarasov, Ali Anwar, Deepavali Bhagwat, Lukas Rupprecht, Dimitris Skourtis, and Erez Zadok. The case for benchmarking control operations in cloud native storage. In *Proceedings of the 12th USENIX Workshop on Hot Topics in Storage (HotStorage '20)*, Boston, MA, July 2020. USENIX.

Tyler Estro, Pranav Bhandari, Avani Wildani, and Erez Zadok. Desperately seeking ... optimal multi-tier cache configurations. In *Proceedings of the 12th USENIX Workshop on Hot Topics in Storage (HotStorage '20)*, Boston, MA, July 2020. USENIX.

Wei Su, Akshay Aurora, Ming Chen, and Erez Zadok. Supporting transactions for bulk NFSv4 compounds. In *Proceedings of the 13th ACM International Systems and Storage Conference (SYSTOR '20)*, Haifa, Israel, June 2020. ACM.

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 '20)*, pages 61–74, Haifa, Israel, June 2020. ACM.

Elinor Schoenfeld, Fan Ye, Bing Zhou, Zongxing Xie, Erez Zadok, Xi Cheng, Jacqueline B. Mondros, Patricia Bruckenthal, and Jignesh Patel. Smart aging: Utilizing low-cost, non-wearable and secure sensing technologies to support the health and wellbeing of community dwelling older adults. In *Proceedings of the HIMSS 20 Preconference Session on Aging and Tech Forum: Addressing the Silver Tsunami*, Orlando, FL, March 2020.

Ibrahim Umit Akgun, Ali Selman Aydin, and Erez Zadok. KMLib: Towards machine learning for operating systems. In *Proceedings of the 2020 On-Device Intelligence Workshop, co-located with the MLSys Conference*, February 2020. Refereed abstract+poster.

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 (FAST '20)*, Santa Clara, CA, February 2020. USENIX Association.

Muhammad Wajahat, Aditya Yele, Tyler Estro, Anshul Gandhi, and Erez Zadok. Distribution fitting and performance modeling for storage traces. In *27th IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2019)*, Rennes, France, October 2019. IEEE Computer Society. (**Won best student paper award**).

Anjul Tyagi, Zhen Cao, Tyler Estro, Klaus Mueller, and Erez Zadok. ICE: Interactive configuration explorer for high dimensional categorical parameter spaces. In *IEEE Conference on Visual Analytics Science and Technology (VAST 2019)*, October 2019.

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 11th USENIX Workshop on Hot Topics in Storage (HotStorage '19)*, Renton, WA, July 2019. USENIX.

Ming Chen and Erez Zadok. Kurma: Secure geo-distributed multi-cloud storage gateways. In *Proceedings of the 12th ACM International Systems and Storage Conference (SYSTOR '19)*, Haifa, Israel, June 2019. ACM.

Zhen Cao, Vasily Tarasov, Sachin Tiwari, and Erez Zadok. Towards better understanding of black-box auto-tuning: A comparative analysis for storage systems. In *Proceedings of the Annual USENIX Technical Conference*, Boston, MA, July 2018. USENIX Association. Data set at `http://download.filesystems.org/auto-tune/ATC-2018-auto-tune-data.sql.gz`.

S. Archak, S. Dixit, R.P. Spillane, and E. Zadok. Multi-tier caching, May 2018. US Patent 9,959,279.

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 (HotStorage '17)*, Santa Clara, CA, July 2017. USENIX. WACI track.

Ming Chen, Dean Hildebrand, Henry Nelson, Jasmit Saluja, Ashok 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 (FAST '17)*, pages 301–314, Santa Clara, CA, February-March 2017. USENIX Association. **(Nominated for best paper award)**.

Bharath Kumar Reddy Vangoor, Vasily Tarasov, and Erez Zadok. To FUSE or not to FUSE: Performance of user-space file systems. In *Proceedings of the 15th USENIX Conference on File and Storage Technologies (FAST '17)*, pages 59–72, Santa Clara, CA, February-March 2017. USENIX Association.

Zhen Cao, Vasily Tarasov, Hari Raman, Dean Hildebrand, and Erez Zadok. On the performance variation in modern storage stacks. In *Proceedings of the 15th USENIX Conference on File and Storage Technologies (FAST '17)*, pages 329–343, Santa Clara, CA, February-March 2017. USENIX Association.

Ming Chen, Arun Vasudevan, Kelong Wang, and Erez Zadok. SeMiNAS: A secure middleware for wide-area network-attached storage. In *Proceedings of the 9th ACM International Systems and Storage Conference (ACM SYSTOR '16)*, Haifa, Israel, June 2016. ACM.

S. Archak, S. Dixit, R.P. Spillane, and E. Zadok. Multi-tier caching, May 2016. US Patent 9,355,109.

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 IEEE Symposium on Mass Storage Systems and Technologies (MSST '16)*, pages 1–7, Santa Clara, California, May 2016. IEEE.

HULU EXHIBIT 1003
Page 13 of 73

Sonam Mandal, Geoff Kuenning, Dongju Ok, Varun Shastry, Pilip 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 (FAST '16)*, pages 315–322, Santa Clara, CA, February 2016. USENIX Association.

Erez Zadok, Aashray Arora, Zhen Cao, Akhilesh Chaganti, Arvind Chaudhary, and Sonam Mandal. Parametric optimization of storage systems. In *HotStorage '15: Proceedings of the 7th USENIX Workshop on Hot Topics in Storage*, Santa Clara, CA, July 2015. USENIX, USENIX.

Vasily Tarasov, Abhishek Gupta, Kumar Sourav, Sagar Trehan, and Erez Zadok. Terra incognita: On the practicality of user-space file systems. In *HotStorage '15: Proceedings of the 7th USENIX Workshop on Hot Topics in Storage*, Santa Clara, CA, July 2015. USENIX, USENIX.

Ming Chen, Dean Hildebrand, Geoff Kuenning, Soujanya Shankaranarayana, Bharat Singh, and Erez Zadok. Newer is sometimes better: An evaluation of NFSv4.1. In *Proceedings of the 2015 ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 2015)*, Portland, OR, June 2015. ACM.

M. Chen, D. Hildebrand, G. Kuenning, S. Shankaranarayana, V. Tarasov, A. Vasudevan, E. Zadok, and K. Zakirova. Linux NFSv4.1 performance under a microscope. In *Proceedings of USENIX LISA*. USENIX Association, November 2014. Extended Abstract.

Vasily Tarasov, Deepak Jain, Geoff Kuenning, Sonam Mandal, Karthikeyani Palanisami, Philip Shilane, Sagar Trehan, and Erez Zadok. Dmdedup: Device mapper target for data deduplication. In *Proceedings of the Linux Symposium*, pages 83–95, Ottawa, Canada, July 2014.

Z. Li, A. Mukker, and E. Zadok. On the importance of evaluating storage systems' $costs. In *Proceedings of the 6th USENIX Conference on Hot Topics in Storage and File Systems*, HotStorage'14, 2014.

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 USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage)*, June 2013.

Vasily Tarasov, Dean Hildebrand, Geoff Kuenning, and Erez Zadok. Virtual machine workloads: The case for new benchmarks for NAS. In *Proceedings of the USENIX Conference on File and Storage Technologies (FAST '13)*, San Jose, CA, February 2013. USENIX Association.

Pradeep Shetty, Richard Spillane, Ravikant Malpani, Binesh Andrews, Justin Seyster, and Erez Zadok. Building workload-independent storage with VT-trees. In *Proceedings of the USENIX Conference on File and Storage Technologies (FAST '13)*, pages 17–30, San Jose, CA, February 2013. USENIX Association.

Z. Li, A. Desai, C. Bhatt, and E. Zadok. vATM: vSphere adaptive task management. In *In Proceedings of the Seventh International Workshop on Feedback Computing (FC'12)*, September 2012.

David S. H. Rosenthal, Daniel C. Rosenthal, Ethan L. Miller, Ian F. Adams, Mark W. Storer, and Erez Zadok. The economics of long-term digital storage. In *The Memory of the World in the Digital age: Digitization and Preservation*. United Nations Educational, Scientific and Cultural Organization (UNESCO), September 2012.

E. Bartocci, R. Grosu, A. Karmarkar, S. A. Smolka, S. D. Stoller, E. Zadok, and J. Seyster. Adaptive runtime verification. In *Proc. 3rd International Conference on Runtime Verification (RV'12)*, Istanbul, Turkey, September 2012.

HULU EXHIBIT 1003
Page 14 of 73

Michael A. Bender, Martin Farach-Colton, Rob Johnson, Russell Kraner, Bradley C. Kuszmaul, Dzejla Medjedovic, Pablo Montes, Pradeep Shetty, Richard P. Spillane, and Erez Zadok. Don't thrash: How to cache your hash on flash. In *Proceedings of the 38th International Conference on Very Large Data Bases (VLDB)*, Istanbul, Turkey, August 2012. Morgan Kaufmann.

Vasily Tarasov, Gyumin Sim, Anna Povzner, and Erez Zadok. Efficient I/O scheduling with accurately estimated disk drive latencies. In *In Proceedings of the 8th Annual Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT'12)*, 2012.

V. Tarasov, A. Mudrankit, W. Buik, P. Shilane, G. Kuenning, and E. Zadok. Generating realistic datasets for deduplication analysis. In *Proceedings of the Annual USENIX Technical Conference*, Boston, MA, June 2012. USENIX Association.

Z. Li, K. M. Greenan, A. W. Leung, and E. Zadok. Power consumption in enterprise-scale backup storage systems. In *Proceedings of the Tenth USENIX Conference on File and Storage Technologies (FAST '12)*, San Jose, CA, February 2012. USENIX Association.

V. Tarasov, K. 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 Tenth USENIX Conference on File and Storage Technologies (FAST '12)*, San Jose, CA, February 2012. USENIX Association.

M.G. Schultz, E. Eskin, E. Zadok, M. Bhattacharyya, and S.S. J. Systems and methods for detection of new malicious executables, July 2011. US Patent 7,979,907.

Richard P. Spillane, Pradeep J. Shetty, Erez Zadok, Shrikar Archak, and Sagar Dixit. An efficient multi-tier tablet server storage architecture. In *Proceedings of the 2nd ACM Symposium on Cloud Computing (SOCC'11)*, Cascais, Portugal, October 2011.

J. Seyster, P. Radhakrishnan, S. Katoch, A. Duggal, S. D. Stoller, and E. Zadok. Redflag: A framework for analysis of kernel-level concurrency. In *Proc. of the 11th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP'11)*, Melbourne, Australia, October 2011.

S. D. Stoller, E. Bartocci, J. Seyster, R. Grosu, K. Havelund, S. A. Smolka, and E. Zadok. Runtime verification with state estimation. In *Proc. 2nd International Conference on Runtime Verification (RV'11)*, San Francisco, CA, September 2011. (**Won best paper award**).

Z. Li, R. Grosu, K. Muppalla, S. A. Smolka, S. D. Stoller, and E. Zadok. Model discovery for energy-aware computing systems: An experimental evaluation. In *Proceedings of the 1st Workshop on Energy Consumption and Reliability of Storage Systems (ERSS'11)*, Orlando, FL, July 2011.

Michel A. Bender, Martin Farach-Colton, Rob Johnson, Bradley C. Kuszmaul, Dzejla Medjedovic, Pablo Montes, Pradeep Shetty, Richard P. Spillane, and Erez Zadok. Don't thrash: How to cache your hash on flash. In *HotStorage '11: Proceedings of the 3rd USENIX Workshop on Hot Topics in Storage*, Portland, OR, June 2011. USENIX Association.

Z. Li, R. Grosu, P. Sehgal, S. A. Smolka, S. D. Stoller, and E. Zadok. On the energy consumption and performance of systems software. In *Proceedings of the 4th Israeli Experimental Systems Conference (ACM SYSTOR '11)*, Haifa, Israel, May/June 2011. ACM.

Vasily Tarasov, Saumitra Bhanage, Erez Zadok, and Margo Seltzer. Benchmarking file system benchmarking: It *IS* rocket science. In *Proceedings of HotOS XIII:The 13th USENIX Workshop on Hot Topics in Operating Systems*, Napa, CA, May 2011.

J. Seyster, K. Dixit, X. Huang, R. Grosu, K. Havelund, S. A. Smolka, S. D. Stoller, and E. Zadok. Aspect-oriented instrumentation with GCC. In *Proc. of the 1st International Conference on Runtime Verification (RV 2010)*, Lecture Notes in Computer Science. Springer, November 2010.

R. Spillane, S. Dixit, S. Archak, S. Bhanage, and E. Zadok. Exporting kernel page caching for efficient user-level I/O. In *Proceedings of the International IEEE Symposium on Mass Storage Systems and Technologies (MSST)*, Incline Village, Nevada, May 2010. IEEE.

Priya Sehgal, Vasily Tarasov, and Erez Zadok. Evaluating performance and energy in file system server workloads. In *Proceedings of the USENIX Conference on File and Storage Technologies (FAST '10)*, pages 253–266, San Jose, CA, February 2010. USENIX Association.

Patrick McDaniel, Kevin Butler, Stephen Mclaughlin, Radu Sion, Erez Zadok, and Marianne Winslett. Towards a secure and efficient system for end-to-end provenance. In *Proceedings of the Second USENIX workshop on the Theory and Practice of Provenance (TAPP '10)*, San Jose, CA, February 2010. USENIX Association.

M.G. Schultz, E. Eskin, E. Zadok, M. Bhattacharyya, and S.J. Salvatore. System and methods for detection of new malicious executables, February 2009. US Patent 7,487,544.

D. J. Dean, S. Callanan, and E. Zadok. The visual development of GCC plug-ins. In *Proceedings of the 2009 GCC Developers' Summit*, Montreal, Canada, June 2009.

C. Yalamanchili, G. Sivathanu, K. Vijayasankar, and E. Zadok. DHIS: Discriminating hierarchical storage. In *Proceedings of the Second ACM Israeli Experimental Systems Conference (SYSTOR '09)*, Haifa, Israel, May 2009. ACM.

Rachita Kothiyal, Vasily Tarasov, Priya Sehgal, and Erez Zadok. Energy and performance evaluation of lossless file data compression on server systems. In *Proceedings of the Second ACM Israeli Experimental Systems Conference (SYSTOR '09)*, Haifa, Israel, May 2009. ACM.

R. Spillane, R. Sears, C. Yalamanchili, S. Gaikwad, M. Chinni, and E. Zadok. Story Book: An efficient extensible provenance framework. In *Proceedings of the First USENIX workshop on the Theory and Practice of Provenance (TAPP '09)*, San Francisco, CA, February 2009. USENIX Association.

R. P. Spillane, S. Gaikwad, E. Zadok, C. P. Wright, and M. Chinni. Enabling transactional file access via lightweight kernel extensions. In *Proceedings of the Seventh USENIX Conference on File and Storage Technologies (FAST '09)*, pages 29–42, San Francisco, CA, February 2009. USENIX Association.

S. Sundararaman, G. Sivathanu, and E. Zadok. Selective versioning in a secure disk system. In *Proceedings of the 17th USENIX Security Symposium*, pages 259–274, San Jose, CA, July-August 2008. USENIX Association.

A. Traeger, I. Deras, and E. Zadok. DARC: Dynamic analysis of root causes of latency distributions. In *Proceedings of the 2008 International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 2008)*, pages 277–288, Annapolis, MD, June 2008. ACM.

D. P. Quigley, K. Albrecht, and E. Zadok. PLEASE: Policy language for easy administration of SELinux. In *Proceedings of the Second annual Computer Security Conference (CSC 2008)*, Myrtle Beach, SC, April 2008.

S. Callanan, D. J. Dean, M. Gorbovitski, R. Grosu, J. Seyster, S. A. Smolka, S. D. Stoller, and E. Zadok. Software monitoring with bounded overhead. In *Proceedings of the 2008 NSF Next*

HULU EXHIBIT 1003
Page 16 of 73

Generation Software Workshop, in conjunction with the 2008 International Parallel and Distributed Processing Symposium (IPDPS 2008), Miami, FL, April 2008.

E. Zadok. The layers are coming, the layers are coming. In *The 2008 Linux Storage and Filesystem Workshop (LSF'08)*, San Jose, CA, February 2008. USENIX Association.

K. Vijayasankar, G. Sivathanu, S. Sundararaman, and E. Zadok. Exploiting type-awareness in a self-recovering disk. In *Proceedings of the Third ACM Workshop on Storage Security and Survivability (StorageSS 2007)*, pages 25–30, Alexandria, VA, October 2007. ACM.

A. Traeger, K. Thangavelu, and E. Zadok. Round-trip privacy with NFSv4. In *Proceedings of the Third ACM Workshop on Storage Security and Survivability (StorageSS 2007)*, pages 1–7, Alexandria, VA, October 2007. ACM.

N. Joukov, A. M. Krishnakumar, C. Patti, A. Rai, S. Satnur, A. Traeger, and E. Zadok. RAIF: Redundant array of independent filesystems. In *Proceedings of 24th IEEE Conference on Mass Storage Systems and Technologies (MSST 2007)*, pages 199–212, San Diego, CA, September 2007. IEEE.

S. Callanan, D. J. Dean, and E. Zadok. Extending GCC with modular GIMPLE optimizations. In *Proceedings of the 2007 GCC Developers' Summit*, pages 31–37, Ottawa, Canada, July 2007.

Richard P. Spillane, Charles P. Wright, Gopalan Sivathanu, and Erez Zadok. Rapid file system development using ptrace. In *Proceedings of the Workshop on Experimental Computer Science (ExpCS), in conjunction with ACM FCRC*, page 22, San Diego, CA, June 2007.

J. Sipek, Y. Pericleous, and E. Zadok. Kernel support for stackable file systems. In *Proceedings of the 2007 Ottawa Linux Symposium (OLS 2007)*, volume 2, pages 223–227, Ottawa, Canada, June 2007.

A. D. A. Martin and E. Zadok. Autofs - an automounting file system for freebsd 6.x. In *Proceedings of the 2007 BSDCan Technical BSD Conference*, Ottawa, ON, Canada, May 2007.

S. Callanan, R. Grosu, J. Seyster, S. A. Smolka, and E. Zadok. Model predictive control for memory profiling. In *Proceedings of the 2007 NSF Next Generation Software Workshop, in conjunction with the 2007 International Parallel and Distributed Processing Symposium (IPDPS 2007)*, Long beach, CA, March 2007.

J. Sipek and E. Zadok. Making Linux stacking-friendly. In *The 2007 Linux Storage and Filesystem Workshop (LSF'07)*, San Jose, CA, February 2007. USENIX Association.

G. Sivathanu, S. Sundararaman, and E. Zadok. Type-safe disks. In *Proceedings of the 7th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2006)*, pages 15–28, Seattle, WA, November 2006. ACM SIGOPS.

Nikolai Joukov, Ashivay Traeger, Rakesh Iyer, Charles P. Wright, and Erez Zadok. Operating system profiling via latency analysis. In *Proceedings of the 7th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2006)*, pages 89–102, Seattle, WA, November 2006. ACM SIGOPS.

N. Joukov, H. Papaxenopoulos, and E. Zadok. Secure deletion myths, issues, and solutions. In *Proceedings of the Second ACM Workshop on Storage Security and Survivability (StorageSS 2006)*, pages 61–66, Alexandria, VA, October 2006. ACM.

A. Traeger, N. Joukov, J. Sipek, and E. Zadok. Using free web storage for data backup. In *Proceedings of the Second ACM Workshop on Storage Security and Survivability (StorageSS 2006)*, pages 73–77, Alexandria, VA, October 2006. ACM.

D. P. Quigley, J. Sipek, C. P. Wright, and E. Zadok. UnionFS: User- and community-oriented development of a unification filesystem. In *Proceedings of the 2006 Linux Symposium*, volume 2, pages 349–362, Ottawa, Canada, July 2006.

S. Callanan, R. Grosu, X. Huang, S. A. Smolka, and E. Zadok. Compiler-assisted software verification using plug-ins. In *Proceedings of the 2006 NSF Next Generation Software Workshop, in conjunction with the 2006 International Parallel and Distributed Processing Symposium (IPDPS 2006)*, Rhodes Island, Greece, April 2006. DOI 10.1109/IPDPS.2006.1639579.

S. Callanan, R. Grosu, A. Rai, S. A. Smolka, M. R. True, and E. Zadok. Runtime verification for high-confidence systems: A Monte Carlo approach. In *Proceedings of the Second Workshop on Model Based Testing (MBT 2006), held in conjunction with the European Joint Conferences on Theory and Practice of Software (ETAPS 2006)*, pages 41–53, Vienna, Austria, March 2006.

Nikolai Joukov, Timothy Wong, and Erez Zadok. Accurate and efficient replaying of file system traces. In *Proceedings of the USENIX Conference on File and Storage Technologies (FAST '05)*, pages 337–350, San Francisco, CA, December 2005. USENIX Association.

N. Joukov and E. Zadok. Adding secure deletion to your favorite file system. In *Proceedings of the third international IEEE Security In Storage Workshop (SISW 2005)*, pages 63–70, San Francisco, CA, December 2005. IEEE Computer Society.

N. Joukov, A. Kashyap, G. Sivathanu, and E. Zadok. Kefence: An electric fence for kernel buffers. In *Proceedings of the First ACM Workshop on Storage Security and Survivability (StorageSS 2005)*, pages 37–43, FairFax, VA, November 2005. ACM. (**Won best short paper award**).

G. Sivathanu, C. P. Wright, and E. Zadok. Ensuring data integrity in storage: Techniques and applications. In *Proceedings of the First ACM Workshop on Storage Security and Survivability (StorageSS 2005)*, pages 26–36, FairFax, VA, November 2005. ACM.

N. Joukov, A. Rai, and E. Zadok. Increasing distributed storage survivability with a stackable raid-like file system. In *Proceedings of the 2005 IEEE/ACM Workshop on Cluster Security, in conjunction with the Fifth IEEE/ACM International Symposium on Cluster Computing and the Grid (CCGrid 2005)*, pages 82–89, Cardiff, UK, May 2005. IEEE. (**Won best paper award**).

C. P. Wright, N. Joukov, D. Kulkarni, Y. Miretskiy, and E. Zadok. Auto-pilot: A platform for system software benchmarking. In *Proceedings of the Annual USENIX Technical Conference, FREENIX Track*, pages 175–187, Anaheim, CA, April 2005. USENIX Association.

E. Zadok, S. Callanan, A. Rai, G. Sivathanu, and A. Traeger. Efficient and safe execution of user-level code in the kernel. In *Proceedings of the 2005 NSF Next Generation Software Workshop, in conjunction with the 2005 International Parallel and Distributed Processing Symposium (IPDPS 2005)*, page 221.1, Denver, CO, April 2005.

A. Kashyap, S. Patil, G. Sivathanu, and E. Zadok. I3FS: An in-kernel integrity checker and intrusion detection file system. In *Proceedings of the 18th USENIX Large Installation System Administration Conference (LISA 2004)*, pages 69–79, Atlanta, GA, November 2004. USENIX Association.

Y. Miretskiy, A. Das, C. P. Wright, and E. Zadok. Avfs: An on-access anti-virus file system. In *Proceedings of the 13th USENIX Security Symposium (Security 2004)*, pages 73–88, San Diego, CA, August 2004. USENIX Association.

K. Muniswamy-Reddy, C. P. Wright, A. Himmer, and E. Zadok. A versatile and user-oriented versioning file system. In *Proceedings of the USENIX Conference on File and Storage Technologies (FAST '04)*, pages 115–128, San Francisco, CA, March/April 2004. USENIX Association.

HULU EXHIBIT 1003
Page 18 of 73

Akshat Aranya, Charles P. Wright, and Erez Zadok. Tracefs: A file system to trace them all. In *Proceedings of the USENIX Conference on File and Storage Technologies (FAST '04)*, pages 129–143, San Francisco, CA, March/April 2004. USENIX Association.

E. Zadok, J. Osborn, A. Shater, C. P. Wright, K. Muniswamy-Reddy, and J. Nieh. Reducing storage management costs via informed user-based policies. In *Proceedings of the 12th NASA Goddard, 21st IEEE Conference on Mass Storage Systems and Technologies (MSST 2004)*, pages 193–197, College Park, MD, April 2004. IEEE.

C. P. Wright, J. Dave, and E. Zadok. Cryptographic file systems performance: What you don't know can hurt you. In *Proceedings of the Second IEEE International Security In Storage Workshop (SISW 2003)*, pages 47–61, Washington, DC, October 2003. IEEE Computer Society.

C. P. Wright, M. Martino, and E. Zadok. NCryptfs: A secure and convenient cryptographic file system. In *Proceedings of the Annual USENIX Technical Conference*, pages 197–210, San Antonio, TX, June 2003. USENIX Association.

Amit Purohit, Charles P. Wright, Joseph Spadavecchia, and Erez Zadok. Cosy: Develop in user-land, run in kernel-mode. In *Proceedings of the 2003 ACM Workshop on Hot Topics in Operating Systems (HotOS IX)*, pages 109–114, Lihue, Hawaii, May 2003. USENIX Association.

R. Grosu, E. Zadok, S. A. Smolka, R. Cleaveland, and Y. A. Liu. High-confidence operating systems. In *Proceedings of the Tenth SIGOPS European Workshop: "Can we really depend on an OS?"*, pages 205–208, Saint-Emilion, France, September 2002.

J. Spadavecchia and E. Zadok. Enhancing NFS cross-administrative domain access. In *Proceedings of the Annual USENIX Technical Conference, FREENIX Track*, pages 181–194, Monterey, CA, June 2002. USENIX Association.

E. Zadok. Overhauling AMD for the '00s: A case study of GNU autotools. In *Proceedings of the Annual USENIX Technical Conference, FREENIX Track*, pages 287–297, Monterey, CA, June 2002. USENIX Association.

E. Zadok, J. M. Anderson, I. Bădulescu, and J. Nieh. Fast indexing: Support for size-changing algorithms in stackable file systems. In *Proceedings of the Annual USENIX Technical Conference (ATC)*, pages 289–304, Boston, MA, June 2001. USENIX Association.

E. Zadok and J. Nieh. FiST: A language for stackable file systems. In *Proceedings of the Annual USENIX Technical Conference*, pages 55–70, San Diego, CA, June 2000. USENIX Association.

E. Zadok, I. Bădulescu, and A. Shender. Extending file systems using stackable templates. In *Proceedings of the Annual USENIX Technical Conference*, pages 57–70, Monterey, CA, June 1999. USENIX Association.

E. Zadok and I. Bădulescu. A stackable file system interface for Linux. In *LinuxExpo Conference Proceedings*, pages 141–151, Raleigh, NC, May 1999.

E. Zadok and A. Dupuy. HLFSD: Delivering Email to your $HOME. In *Proceedings of the Seventh USENIX Systems Administration Conference (LISA VII)*, pages 243–254, Monterey, CA, November 1993. USENIX Association.

E. Zadok and D. Duchamp. Discovery and hot replacement of replicated read-only file systems, with application to mobile computing. In *Proceedings of the Summer USENIX Technical Conference*, pages 69–85, Cincinnati, OH, June 1992. USENIX Association.

HULU EXHIBIT 1003
Page 19 of 73

M. G. Schultz, E. Eskin, E. Zadok, M. Bhattacharyya, and S. J. Stolfo. MEF: Malicious Email Filter — A UNIX Mail Filter that Detects Malicious Windows Executables. In *Proceedings of the Annual USENIX Technical Conference, FREENIX Track*, pages 245–252, Boston, MA, June 2001. (**Won best student paper award**).

M. G. Schultz, E. Eskin, E. Zadok, and S. J. Stolfo. Data mining methods for detection of new malicious executables. In *Proceedings of the IEEE Symposium on Security and Privacy*, pages 38–49, Oakland, CA, May 2001.

W. Lee, W. Fan, M. Miller, S. Stolfo, and E. Zadok. Toward cost-sensitive modeling for intrusion detection and response. In *Workshop on Intrusion Detection and Prevention, Seventh ACM Conference on Computer Security (CCS)*, pages 1–22, Athens, Greece, November 2000.

Other Publications

Christopher Smith, Maliha Tabassum, Soumya Chowdary Daruru, Gaurav Kulhare, Arvin Wang, Ethan Miller, and Erez Zadok. Plugging the leaks in secure archival systems. Non-archival Poster presentation in the 22nd USENIX Conference on File and Storage Technologies (FAST'24), February 2024.

Alex Merenstein. Moving beyond host based virtualization: New techniques for performance measurement and data management in cloud native environments. Technical Report FSL-24-01, Computer Science Department, Stony Brook University, January 2024.

Mario Antunes, Tyler Estro, Pranav Bhandari, Anshul Gandhi, Geoff Kuenning, Yifei Liu, Carl Waldspurger, Avani Wildani, and Erez Zadok. (multi)knee/elbow point detection library, December 2023.

Syed Rafiul Hussain, Patrick McDaniel, Anshul Gandhi, Kanad Ghose, Kartik Gopalan, Dongyoon Lee, Yu David Liu, Zhenhua Liu, Shuai Mu, and Erez Zadok. Verifiable sustainability in data centers, July 2023. https://arxiv.org/abs/2307.11993.

Tyler Estro, Mario Antunes, Pranav Bhandari, Anshul Gandhi, Geoff Kuenning, Yifei Liu, Carl Waldspurger, Avani Wildani, and Erez Zadok. Guiding simulations of multi-tier storage caches using knee detection. Technical Report FSL-23-01, Computer Science Department, Stony Brook University, July 2023.

Elinor Schoenfeld, Tracy Trimboli, Givenchy Ayisi-Boahene, Patricia Bruckenthal, Shelley Horwitz, Erez Zadok, and Fan Ye. Smart aging: Engaging older adults to guide sensor development to support aging in place. In *Issues and experiences of integrating patient and community stakeholder perspectives in aging research*, Tampa, FL, Nov 2023.

Elinor Schoenfeld, Tracy Trimboli, Kaylyn Finnerty, Givenchy Ayisi-Boahene, Patricia Bruckenthal, Shelley Horwitz, Erez Zadok, and Fan Ye. Engaging older adults to guide low-cost non-wearable sensor technology development to age in place: Survey findings. In *Gerontology Society of America Annual Meeting (GSA 2023)*, Tampa, FL, Nov 2023.

Yifei Liu, Gerard Holzmann, Geoff Kuenning, Scott Smolka, and Erez Zadok. The case for model checking emerging file systems. Non-archival poster presentation in the 17th USENIX Symposium on Operating Systems Design and Implementation (OSDI '23), July 2023.

Tyler Estro, Kamalnath Polakam, and Erez Zadok. Using bash notebooks for systems education (user meeting 23). `https://www.chameleoncloud.org/experiment/share/82fbba82-1b34-4562-9866-b7adaec94b19`.

HULU EXHIBIT 1003
Page 20 of 73

Ibrahim "Umit" Akgun. Using machine learning to improve operating systems' I/O subsystems. Technical Report FSL-22-03, Computer Science Department, Stony Brook University, December 2022.

Ibrahim "Umit" Akgun. Using machine learning to improve operating systems' I/O subsystems. Technical Report FSL-22-02, Computer Science Department, Stony Brook University, June 2022.

Sayontan Ghosh, Amanpreet Singh, Alex Merenstein, Wei Su, Scott Smolka, Erez Zadok, and Niranjan Balasubramanian. SpecNFS: A challenge dataset towards extracting formal models from natural language specifications. Non-archival poster presentation in the Workshop on Natural Language Processing for Programming in the ACL'21 conference, August 2021.

Tyler Estro. Accelerating multi-tier cache evaluations with intelligent MRC point selection. Technical Report FSL-21-01, Computer Science Department, Stony Brook University, January 2021.

Wei Su. Supporting transactions for bulk NFSv4 compounds. Technical Report FSL-20-02, Computer Science Department, Stony Brook University, December 2020.

Alex Merenstein. CNSBench: A cloud native storage benchmark. Technical Report FSL-20-01, Computer Science Department, Stony Brook University, December 2020.

Ibrahim "Umit" Akgun. Re-animator: Versatile high-fidelity system-call tracing and replaying. Technical Report FSL-19-02, Computer Science Department, Stony Brook University, May 2019.

George Amvrosiadis, Ali R. Butt, Vasily Tarasov, Erez Zadok, Ming Zhao, Irfan Ahmad, Remzi H. Arpaci-Dusseau, Feng Chen, Yiran Chen, Yong Chen, Yue Cheng, Vijay Chidambaram, Dilma Da Silva, Angela Demke-Brown, Peter Desnoyers, Jason Flinn, Xubin He, Song Jiang, Geoff Kuenning, Min Li, Carlos Maltzahn, Ethan L. Miller, Kathryn Mohror, Raju Rangaswami, Narasimha Reddy, David Rosenthal, Ali Saman Tosun, Nisha Talagala, Peter Varman, Sudharshan Vazhkudai, Avani Waldani, Xiaodong Zhang, Yiying Zhang, and Mai Zheng. Data storage research vision 2025: Report on NSF visioning workshop held may 30–june 1, 2018. Technical report, National Science Foundation, February 2019. `https://dl.acm.org/citation.cfm?id=3316807`.

Zhen Cao. *A Practical Auto-Tuning Framework for Storage Systems*. PhD thesis, Stony Brook University, January 2019.

Zhen Cao. A practical, real-time auto-tuning framework for storage systems. Technical Report FSL-18-01, Computer Science Department, Stony Brook University, April 2018.

M. Chen. *Kurma: Efficient and Secure Multi-Cloud Storage Gateways for Network-Attached Storage*. PhD thesis, Computer Science Department, Stony Brook University, April 2017. Technical Report FSL-17-01.

Bharath Kumar Reddy Vangoor. To FUSE or not to FUSE? analysis and performance characterization of the FUSE user-space file system framework. Master's thesis, Stony Brook University, December 2016. Technical Report FSL-16-02, `http://www.fsl.cs.sunysb.edu/docs/fuse/bharath-msthesis.pdf`.

Zhen Cao. Parametric optimization of storage systems. Technical Report FSL-16-01, Computer Science Department, Stony Brook University, January 2016.

Sonam Mandal. Design and implementation of an open-source deduplication platform for research. Technical Report FSL-15-03, Computer Science Department, Stony Brook University, December 2015.

HULU EXHIBIT 1003
Page 21 of 73

Ming Chen. Kurma: Geo-distributed secure middlewares for cloud-backed network attached storage. Technical Report FSL-15-02, Computer Science Department, Stony Brook University, November 2015.

Arun Olappamanna Vasudevan. Finding the right balance: Security vs. performance with network storage systems. Master's thesis, Stony Brook University, May 2015. Technical Report FSL-15-01, `http://www.fsl.cs.sunysb.edu/docs/arun-msthesis/arun-msthesis.pdf`.

Benixon Arul Dhas, Erez Zadok, James Borden, and Jim Malina. Evaluation of Nilfs2 for shingled magnetic recording (SMR) disks. Technical Report FSL-14-03, Stony Brook University, September 2014.

M. Chen, D. Hildebrand, G. Kuenning, S. Shankaranarayana, V. Tarasov, A. Vasudevan, E. Zadok, and K. Zakirova. Linux NFSv4.1 performance under a microscope. Technical Report FSL-14-02, Stony Brook University, August 2014.

Z. Li. *GreenDM: A Versatile Tiering Hybrid Drive for the Trade-Off Evaluation of Performance, Energy, and Endurance*. PhD thesis, Computer Science Department, Stony Brook University, May 2014.

M. Palmur, Z. Li, and E. Zadok. Cpuidle from user space. Technical Report FSL-13-05, Computer Science Department, Stony Brook University, December 2013.

V. Tarasov. *Multi-dimensional Workload Analysis and Synthesis for Modern Storage Systems*. PhD thesis, Computer Science Department, Stony Brook University, December 2013.

Zhichao Li. System-aware resource scheduling for performance, energy, and reliability in tiered storage systems. Technical Report FSL-13-03, Computer Science Department, Stony Brook University, May 2013.

V. Tarasov. Multi-dimensional workload analysis and synthesis for modern storage systems. Technical Report FSL-13-02, Computer Science Department, Stony Brook University, April 2013.

M. Chen and E. Zadok. Greendm: A versatile hybrid drive for energy and performance. Technical Report FSL-13-01, Computer Science Department, Stony Brook University, April 2013.

J. Seyster. *Runtime Verification of Kernel-Level Concurrency Using Compiler-Based Instrumentation*. PhD thesis, Computer Science Department, Stony Brook University, December 2012. Technical Report FSL-12-05, `www.fsl.cs.sunysb.edu/docs/jseyster-dissertation/redflag.pdf`.

Pradeep J. Shetty, Richard P. Spillane, Ravikant R. Malpani, Binesh Andrews, Justin Seyster, and Erez Zadok. Unifying file systems and databases efficiently. Technical Report FSL-12-06, Stony Brook University Computer Science, September 2012.

A. Mudrankit. A context aware block layer: The case for block layer deduplication. Master's thesis, Stony Brook University, May 2012. Technical Report FSL-12-04.

P. J. Shetty. From tuples to files: a fast transactional system store and file system. Master's thesis, Stony Brook University, May 2012. Technical Report FSL-12-03.

S. Archak, S. Dixit, R.P. Spillane, and E. Zadok. Multi-tier caching, March 2012. US Patent App. 13/159,039.

R. P. Spillane. *Efficient, Scalable, and Versatile Application and System Transaction Management for Direct Storage Layers*. PhD thesis, Computer Science Department, Stony Brook University, Jan 2012. Technical Report FSL-12-02.

J. Seyster. Runtime verification of kernel-level concurrency using compiler-based instrumentation. Technical Report FSL-12-01, Computer Science Department, Stony Brook University, January 2012. www.fsl.cs.sunysb.edu/docs/jseyster-proposal/redflag.pdf.

A. Duggal. Stopping data races using Redflag. Master's thesis, Stony Brook University, May 2010. Technical Report FSL-10-02, http://www.fsl.cs.sunysb.edu/docs/abhinav-thesis/abhinav_thesis.pdf.

P. Sehgal. Optimizing energy and performance for server-class file system workloads. Master's thesis, Stony Brook University, May 2010. Technical Report FSL-10-01.

S. Callanan. *Flexible Debugging with Controllable Overhead*. PhD thesis, Computer Science Department, Stony Brook University, August 2009. Technical Report FSL-09-01, http://www.fsl.cs.sunysb.edu/docs/callanan09phdthesis/callanan09phdthesis.pdf.

R. P. Spillane. SAMT performance proof. Technical Report FSL-09-03, Stony Brook University Computer Science, June 2009. www.fsl.cs.sunysb.edu/~rick.

D. Dean. The visual development of GCC plug-ins with GDE. Master's thesis, Stony Brook University, April 2009. Technical Report FSL-09-04.

R. Kothiyal. Energy and performance evaluation of lossless file data compression on computer systems. Master's thesis, Stony Brook University, April 2009. Technical Report FSL-09-02.

R. P. Spillane, S. Gaikwad, E. Zadok, C. P. Wright, and M. Chinni. Enabling transactional file access via lightweight kernel extensions. Technical Report FSL-08-05, Stony Brook University Computer Science, August 2008.

A. Traeger. *Analyzing Root Causes of Latency Distributions*. PhD thesis, Computer Science Department, Stony Brook University, August 2008. Technical Report FSL-08-04.

J. Seyster. Techniques for visualizing software execution. Technical Report FSL-08-03, Computer Science Department, Stony Brook University, March 2008. www.fsl.cs.sunysb.edu/docs/debugging-tr/software-visualization-tr.pdf.

S. Callanan. Remote debugging with controllable overhead. Technical Report FSL-08-02, Computer Science Department, Stony Brook University, March 2008. www.fsl.cs.sunysb.edu/docs/debugging-tr/debugging-proposal.pdf.

G. Sivathanu. *End-to-End Abstractions for Application-Aware Storage*. PhD thesis, Computer Science Department, Stony Brook University, May 2008. Technical Report FSL-08-01.

D. P. Quigley. PLEASE: Policy language for easy administration of SELinux. Master's thesis, Stony Brook University, May 2007. Technical Report FSL-07-02, www.fsl.cs.sunysb.edu/docs/dquigley-msthesis/dquigley-msthesis.pdf.

N. Joukov. *Versatile, Portable, and Efficient File System Profiling*. PhD thesis, Computer Science Department, Stony Brook University, December 2006. Technical Report FSL-06-05.

C. P. Wright. *Extending ACID Semantics to the File System via ptrace*. PhD thesis, Computer Science Department, Stony Brook University, May 2006. Technical Report FSL-06-04.

N. Joukov, A. Traeger, R. Iyer, C. P. Wright, and E. Zadok. Latency as a viable metric for OS profiling. Technical Report FSL-06-03, Computer Science Department, Stony Brook University, April 2006.

R. Spillane, C. P. Wright, G. Sivathanu, and E. Zadok. Rapid file system development using ptrace. Technical Report FSL-06-02, Computer Science Department, Stony Brook University, January 2006.

HULU EXHIBIT 1003
Page 23 of 73

C. P. Wright, R. Spillane, G. Sivathanu, and E. Zadok. Extending ACID semantics to the file system. Technical Report FSL-06-01, Computer Science Department, Stony Brook University, January 2006. www.fsl.cs.sunysb.edu/docs/amino-tr/amino.pdf.

G. Sivathanu and E. Zadok. A versatile persistent caching framework for file systems. Technical Report FSL-05-05, Computer Science Department, Stony Brook University, December 2005. www.fsl.cs.sunysb.edu/docs/cachefs-tr/cachefs.pdf.

N. Joukov, A. Traeger, C. P. Wright, and E. Zadok. Benchmarking file system benchmarks. Technical Report FSL-05-04, Computer Science Department, Stony Brook University, December 2005. www.fsl.cs.sunysb.edu/docs/fsbench/fsbench.pdf.

S. Satnur. Storage virtualization with a stackable file system. Master's thesis, Stony Brook University, December 2005. Technical Report FSL-05-03, www.fsl.cs.sunysb.edu/docs/sunil-msthesis/sunil-msthesis.pdf.

E. Zadok, S. Callanan, R. Grosu, A. Rai, S. Smolka, and M. R. True. Runtime verification for high-confidence OS kernels: A Monte Carlo approach. Technical Report FSL-05-02, Computer Science Department, Stony Brook University, November 2005.

A. Rai and E. Zadok. On the role of static analysis in operating system checking and runtime verification. Technical Report FSL-05-01, Computer Science Department, Stony Brook University, May 2005. www.fsl.cs.sunysb.edu/docs/kgcc-rpe/kgcc.pdf.

E. Zadok, C. Wright, A. Aranya, A. Das, Y. Miretskiy, K.K. Muniswamy-Reddy, and A. Himmer. Stackable file systems and methods thereof, December 2005. US Patent App. 10/862,212.

A. Kashyap. File system extensibility and reliability using an in-kernel database. Master's thesis, Stony Brook University, December 2004. Technical Report FSL-04-06, www.fsl.cs.sunysb.edu/docs/kbdbfs-msthesis/kbdbfs.pdf.

A. Aranya. Versatile file system tracing with Tracefs. Master's thesis, Stony Brook University, August 2004. Technical Report FSL-04-05, www.fsl.cs.sunysb.edu/docs/tracefs-msthesis/tracefs.pdf.

G. Sivathanu, C. P. Wright, and E. Zadok. Enhancing file system integrity through checksums. Technical Report FSL-04-04, Computer Science Department, Stony Brook University, May 2004. www.fsl.cs.sunysb.edu/docs/nc-checksum-tr/nc-checksum.pdf.

A. Traeger, A. Rai, C. P. Wright, and E. Zadok. NFS file handle security. Technical Report FSL-04-03, Computer Science Department, Stony Brook University, May 2004. www.fsl.cs.sunysb.edu/docs/nfscrack-tr/nfscrack.pdf.

C. P. Wright and E. Zadok. Operating system support for extensible secure file systems. Technical Report FSL-04-02, Computer Science Department, Stony Brook University, May 2004. www.fsl.cs.sunysb.edu/docs/secfs-rpe/secfs.pdf.

C. P. Wright, J. Dave, P. Gupta, H. Krishnan, E. Zadok, and M. N. Zubair. Versatility and Unix semantics in a fan-out unification file system. Technical Report FSL-04-01b, Computer Science Department, Stony Brook University, October 2004. www.fsl.cs.sunysb.edu/docs/unionfs-tr/unionfs.pdf.

K. Muniswamy-Reddy. Versionfs: A versatile and user-oriented versioning file system. Master's thesis, Stony Brook University, December 2003. Technical Report FSL-03-03, www.fsl.cs.sunysb.edu/docs/versionfs-msthesis/versionfs.pdf.

HULU EXHIBIT 1003
Page 24 of 73

C. P. Wright, J. Dave, and E. Zadok. Cryptographic file systems performance: What you don't know can hurt you. Technical Report FSL-03-02, Computer Science Department, Stony Brook University, August 2003. www.fsl.cs.sunysb.edu/docs/nc-perf/perf.pdf.

E. Zadok, J. Osborn, A. Shater, C. P. Wright, K. Muniswamy-Reddy, and J. Nieh. Reducing storage management costs via informed user-based policies. Technical Report FSL-02-02, Computer Science Department, Stony Brook University, September 2002. www.fsl.cs.sunysb.edu/docs/equota-policy/policy.pdf.

A. Purohit, J. Spadavecchia, C. Wright, and E. Zadok. Improving application performance through system call composition. Technical Report FSL-02-01, Computer Science Department, Stony Brook University, June 2003. www.fsl.cs.sunysb.edu/docs/cosy-perf/.

O. C. Leonard, J. Nieh, E. Zadok, J. Osborn, A. Shater, and C. Wright. The design and implementation of elastic quotas: A system for flexible file system management. Technical Report CUCS-014-02, Computer Science Department, Columbia University, June 2002. www.cs.columbia.edu/~library.

E. Zadok. *FiST: A System for Stackable File System Code Generation*. PhD thesis, Computer Science Department, Columbia University, May 2001. www.fsl.cs.sunysb.edu/docs/zadok-phd-thesis/thesis.pdf.

Wenke Lee, Matthew Miller, Salvatore Stolfo, Kahil Jallad, Christopher T Park, Erez Zadok, and Vijay Prabhakar. Toward cost-sensitive modeling for intrusion detection. Technical Report CUCS-002-00, Computer Science Department, Columbia University, 2000. http://academiccommons.columbia.edu/download/fedora_content/download/ac:110332/CONTENT/cucs-002-00.pdf.

Erez Zadok, Johan M Andersen, Ion Badulescu, and Jason Nieh. Performance of size-changing algorithms in stackable file systems. Technical Report CUCS-023-00, Computer Science Department, Columbia University, 2000. http://academiccommons.columbia.edu/download/fedora_content/download/ac:110385/CONTENT/cucs-023-00.pdf.

E. Zadok. Stackable file systems as a security tool. Technical Report CUCS-036-99, Computer Science Department, Columbia University, December 1999. www.cs.columbia.edu/~library.

E. Zadok and I. Bădulescu. Usenetfs: A stackable file system for large article directories. Technical Report CUCS-022-98, Computer Science Department, Columbia University, July 1998. www.cs.columbia.edu/~library.

E. Zadok, I. Bădulescu, and A. Shender. Cryptfs: A stackable vnode level encryption file system. Technical Report CUCS-021-98, Computer Science Department, Columbia University, June 1998. www.cs.columbia.edu/~library.

E. Zadok. *FiST: A File System Component Compiler*. PhD thesis, Computer Science Department, Columbia University, April 1997. www.fsl.cs.sunysb.edu/docs/zadok-thesis-proposal.

E. Zadok. Discovery and hot replacement of replicated read-only file systems, with application to mobile computing. Master's thesis, Computer Science Department, Columbia University, October 1997. Technical Report CUCS-036-94, www.cs.columbia.edu/~library.

E. Zadok and A. Lih. PGMAKE: A Portable Distributed Make System. Technical Report CUCS-035-94, Computer Science Department, Columbia University, July 1994. www.cs.columbia.edu/~library.

HULU EXHIBIT 1003
Page 25 of 73

Manuals

C. P. Wright and E. Zadok. *The Auto-pilot Benchmarking Suite User Manual*, 2.1 edition, July 2005. `www.filesystems.org/docs/auto-pilot/`.

J. S. Pendry, N. Williams, and E. Zadok. *Am-utils User Manual*, 6.1b3 edition, July 2003. `www.am-utils.org`.

PATENTS

Multi-Tier Caching, U.S. Patent 9,959,279, issued May 1, 2018.

Multi-Tier Caching, U.S. Patent 9,355,109, issued May 31, 2016.

Systems and methods for detection of new malicious executables, U.S. Patent 7,979,907B2, issued July 12, 2011.

System and methods for detection of new malicious executables, U.S. Patent 7,487,544B2, issued February 3, 2009.

ACADEMIC SERVICE

Program Committee Chair

2019-2020	The 2020 USENIX Annual Technical Conference (ATC 2020) program committee co-chair.
2015	The 13th USENIX Conference on File and Storage Technologies (FAST 2015) program committee co-chair.
2012	The 5th Israeli Experimental Systems Conference (SYSTOR 2012), program committee co-chair.
2010	The First Usenix Workshop on Sustainable Information Technology (SustainIT 2010), program committee co-chair.
2008	The First File-systems and Storage Benchmarking workshop, program chair (hosted at the Storage Systems Research Center at the University of California at Santa Cruz).
2006	ACM Storage Security and Survivability (StorageSS) workshop, program committee co-chair.
2005	Usenix Annual Conference 2005, Invited Talks program co-chair
2004	Usenix Security 2004, Works-in-Progress program chair
2004	Usenix Security 2004, Poster presentations program chair
2003	USENIX FreeNIX 2003 Annual Conference, program chair

Panels

Oct 2021	NSF CAREER review panel
June 2013	Panelist, EMC University Day, “University/Industry Relationships”
Jan 2012	NSF Sustainability Research Network (SRN) program
May 2010	Department of Energy, Computational and Technology Research program

Feb 2009	Panel moderator, The First Usenix Workshop on Sustainable Information Technology (SustainIT 2010), "The Present and Future of Sustainability R&D"
Oct 2009	Panelist, Workshop on Hot Topics in Storage and File Systems (HotStorage'09), "Rethinking File Systems"
Oct 2009	NSF CAREER (CSR+CNS) review panel
Apr 2007	NSF Computer Systems Research (CSR) Parallel and Distributed Operating Systems (PDOS) review panel
Aug 2004	NSF CyberTrust PI meeting panelist, "Software Assurance," Pittsburgh, PA
Aug 2004	Workshop on Information Assurance Education, Stony Brook University (WIAED 2004), panel chair, "How to establish your own IA Curriculum"
Apr 2004	NSF Distributed Systems and Compilers (DSC) review panel
Apr 2001	NSF ITR Operating Systems and Compilers (OSC) review panel, small grants

Editor-in-Chief

Nov 2012–present	Editor-in-Chief, ACM Transactions on Storage (TOS). `https://dl.acm.org/journal/tos/`

Editor

2014	Editorial Board, USENIX Journal of Education in System Administration (JESA). `www.usenix.org/jesa/`
Aug 2009–2012	Associate Editor, ACM Transactions on Storage (TOS). `https://tos.acm.org/`
Jul 2001–Jan 2009	Bulletin Editor, Webmaster, and lists maintainer for IEEE Technical Committee on Operating Systems and Application Environments (TCOS). `www.tcos.org`.

Book Reviews

Summer 2014	Technical reviewer for *The Design and Implementation of the FreeBSD Operating System (2nd Edition)*, Addison-Wesley, 2014, by Marshall Kirk McKusick, George Neville-Neil, and Robert N.M. Watson.
Summer 2005	Technical reviewer for *Understanding the Linux Kernel*, O'Reilly, 3rd ed., by P. Bovet and M. Cesati
Summer 2005	Technical reviewer for *The Design and Implementation of the FreeBSD Operating System*, Addison-Wesley, 2005, by Marshall Kirk McKusick and George V. Neville-Neil (two chapters)
Summer 2002	Technical reviewer for *Understanding the Linux Kernel*, O'Reilly, 2nd ed., by P. Bovet and M. Cesati
January 1994	Chapter 14 in *UNIX Systems for Modern Architectures* by Curt Schimmel (Addison-Wesley, 1994)

Program Committee Member

2019	The 2019 USENIX Annual Technical Conference (ATC 2019), Renton, WA.
2018	The 10th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage '18), Boston, MA.

HULU EXHIBIT 1003
Page 27 of 73

2018	The 9th Annual Non-Volatile Memories Workshop (NVME 2018), San Diego, CA.
2017	The 4th FAST/Linux Summit, Santa Clara, CA.
2016–2017	The 15th USENIX Conference on File and Storage Technologies (FAST '17), Santa Clara, CA.
2016	The 3rd FAST/Linux Summit, Santa Clara, CA.
2015	The 2nd FAST/Linux Summit, Santa Clara, CA.
2014	USENIX 2nd Summit for Educators in System Administration (SESA 2014), Seattle, Washington (co-located with LISA'14).
2014	The 7th Israeli ACM Experimental Systems Conference (ACM SYSTOR 2014), Haifa, Israel.
2014	The 12th USENIX Conference on File and Storage Technologies (FAST '14), Santa Clara, CA.
2014	The 1st FAST/Linux Summit, Santa Clara, CA.
2013	USENIX 1st Summit for Educators in System Administration (SESA 2013), Seattle, Washington (co-located with LISA'13).
2013	Interactions of NVM/Flash with Operating-Systems and Workloads Workshop (INFLOW 2013), Farmington, PA (co-located with SOSP'13).
2013	International Conference on Parallel and Distributed Systems (ICPADS 2013), Seoul, Korea.
2011	Operating System Support for Next Generation Large Scale NVRAM (NVRAMOS'11), Jeju Island, South Korea.
2011	The 4th Israeli Experimental Systems Conference (SYSTOR 2011), Haifa, Israel.
2011	The 27th IEEE Symposium on Massive Storage Systems and Technologies (MSST2011), Research Track. Colorado.
2011	The 2011 USENIX Annual Technical Conference
2010	The 26th IEEE Symposium on Massive Storage Systems and Technologies (MSST2010), Research Track. Incline Village, Nevada.
2010	The 3rd Israeli Experimental Systems Conference (SYSTOR 2010), Haifa, Israel.
2009	The 21st International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD 2009).
2009	The first Usenix workshop on the theory and practice of provenance (TAPP '09).
2009	The 2009 ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 2009), New York, NY.
2009	The 2nd Israeli Experimental Systems Conference (SYSTOR 2009), Haifa, Israel.
2008	Fifth USENIX Conference on File and Storage Technologies (FAST '08), San Jose, CA.

2007	The Third ACM International Workshop on Storage Security and Survivability (StorageSS 2007), Alexandria, VA
2007	Fifth USENIX Conference on File and Storage Technologies (FAST '07)
2006	CCGrid Cluster Security workshop (in conjunction with CCGrid 2006, the Sixth IEEE/ACM International Symposium on Cluster Computing and the Grid), Singapore, Korea.
2005	The 3rd International IEEE Security in Storage Workshop (co-sponsored by Usenix), San Francisco, CA
2005	The First ACM International Workshop on Storage Security and Survivability (StorageSS), "The Paradigm Shift to Info-Centric Protection," Fairfax, VA
2004–2005	CCGrid Cluster Security workshop (in conjunction with CCGrid 2005, the Fifth IEEE/ACM International Symposium on Cluster Computing and the Grid), Cardiff, UK
2004	Workshop on Information Assurance Education, Stony Brook University (WIAED 2004), organizer
2002	USENIX FreeNIX 2002 Annual Conference
2001	First USENIX Conference on File and Storage Technologies (FAST '02)

Session Chair

Oct 2020	Keynote by Richardo Biancini, the 13th ACM International System and Storage Conference
Jul 2019	Co-chair, ACM Workshop on on Hot Topics in Storage and File Systems (HotStorage), "File Systems"
Jan 2015	The annual NSF Secure and Trustworthy Computing (SaTC) program PI meeting (SaTC-PI 2015), "Benchmarking and workloads"
Feb 2014	The 12th USENIX Conference on File and Storage Technologies (FAST '14), "Performance and Efficiency"
June 2011	The 2011 Usenix Annual Technical Conference (Usenix ATC '11), "Storage Deduplication"
July 2013	The 6th Israeli Experimental Systems Conference (SYSTOR '13), "Flash Optimization"
May 2011	The 4th Israeli Experimental Systems Conference (ACM SYSTOR '11), "Adaptation and performance"
May 2009	The 2nd Israeli Experimental Systems Conference (ACM SYSTOR '09), "Deduplication"
Feb 2009	The first Usenix workshop on the theory and practice of provenance (TAPP '09)
May 2009	Fifth USENIX Conference on File and Storage Technologies (FAST '07), "Beyond the Machine Room"
Nov 2005	ACM International Workshop on Storage Security and Survivability (StorageSS), "Cryptographic Storage Security"

	Usenix Security 2004, Works-in-Progress session chair
Aug 2004	Usenix Security 2004, Works-in-Progress session chair
Aug 2004	Usenix Security 2004, Poster presentations session chair
Jun 2002	USENIX FreeNIX Annual Conference, “File Systems”
Jun 2001	USENIX FreeNIX Annual Conference, “Scripting”

Referee

Feb 2022	USENIX FAST 2022
Nov 2020	ACM Transactions on Storage (TOS)
Oct 2018	IEEE Transactions on Parallel and Distributed Systems (TDPS)
Aug 2017	ACM Transactions on Storage (TOS)
2016	Runtime Verification (RV) 2016
2011	Sustainable Computing Informatics and Systems journal
Nov 2010	ACM SIGMOD 2010
Oct 2010	IEEE Internet Computing
Jan 2010	ACM Transactions on Computers (TOCS)
Dec 2009	IEEE Transactions on Parallel and Distributed Systems (TPDS)
Feb 2009	USENIX FAST 2009
Feb 2007	USENIX Annual conference 2007
Jan 2007	Sigmetrics 2007
Jul 2006	Elsevier’s Information Sciences journal
Feb 2006	USENIX Annual conference 2006
Aug 2005	USENIX FAST 2005
Aug 2004–present	ACM Transactions on Storage (TOS) journal
Jun 2004	USENIX OSDI 2004
Nov 2003	USENIX FAST 2004
Dec 2002	USENIX FREENIX 2003
Jun 2002	USENIX OSDI 2002
May 2002	ACM Mobile Networks and Applications (MONET)
Mar 2002	16th Annual ACM International Conference on Supercomputing (ICS)
Mar 2002	LCTES/SCOPES ’02: ACM SIGPLAN Joint Conference on Languages, Compilers, and Tools for Embedded Systems and Software and Compilers for Embedded Systems.
Jan 2002	USENIX FreeNIX Annual Conference
Mar 2001	8th Workshop on Hot Topics in Operating Systems (HotOS-VIII)

HULU EXHIBIT 1003
Page 30 of 73

Jan 2001	USENIX Annual Conference
Jan 2001	USENIX FreeNIX Annual Conference
May 2000	USENIX LISA 14
Dec 2000	USENIX Annual Conference
May 1999	USENIX LISA 13
May 1999	ACM Twelfth Annual Symposium on User Interface Software and Technology (UIST '99)
Mar 1996	2nd International Mobile Computing Conference
1994	Trends in Software: Software Configuration Management

Committee Service

2021–present	Tiger Team lead, "Data Storage, Data Management, Distributed Ledger Technologies, Cybersecurity, and Biometrics," Stony Brook University.
2020–present	Steering Committee member, USENIX Annual Technical Conference (USENIX ATC)
2020–present	Steering Committee member, ACM Workshop on on Hot Topics in Storage and File Systems (HotStorage)
2021–2022	Co-Chair, President's "One Campus IT Operations" (OCITO) working group, Stony Brook University.
2017–2020	Member, Provost Committee on Faculty Mentorship, Stony Brook University
2017	Member, ad-hoc SL-2 hiring committee for CS Staff Assistant, Computer Science Department, Stony Brook University
2016–2020	Member, STRIDE project advisory committee, Institute for Advanced Computational Science (IACS) and Computer Science Department, Stony Brook University
2016–2019	Chair, Research and IT/Building Operations committee, Computer Science Department, Stony Brook University (note: also official mentor to all junior CS faculty).
2016-2017	Member, ad-hoc hiring committee for CEAS Grant Writer, College of Engineering and Applied Science, Stony Brook University
2016	Member, ABET funding cmte, College of Engineering and Applied Science, Stony Brook University
2015–present	Steering Committee member, USENIX Filesystem and Storage Technologies Conference (USENIX FAST)
2014	Member, Executive committee, Computer Science Department, Stony Brook University
2014	Member, ad-hoc committee for selection of departmental award, Computer Science Department, Stony Brook University
2014	Member, Provost's Outstanding Lecturer Selection Committee, Stony Brook University

2013	Member, Provost's Interdisciplinary Faculty Cluster Selection Committee, Stony Brook University
2013–present	Undergraduate Curriculum Committee, Computer Science Department, Stony Brook University
2013–present	Member, Provost's Massive Open Online Courses (MOOCS) Task Force, Stony Brook University
2012–present	Steering Committee member, The Israeli ACM Experimental Systems Conference (ACM SYSTOR)
2011–2015	Co-Chair, IT Operations committee, Computer Science Department, Stony Brook University
2011–present	Member, University Senate Information Technology Committee, Stony Brook University
2011–present	Member, President's Information Technology Steering Committee on Email and Collaboration, Stony Brook University
2006–2011	Director of IT Operations, Computer Science Department, Stony Brook University
2010–present	Advanced Energy Research and Technology Center (AERTC), Center Director Search Committee member, Stony Brook University
2012	Member, Grant Writer Recruiting committee, Computer Science Department, Stony Brook University
2011	Staff Recruiting committee chair (Windows Server administrator), Computer Science Department, Stony Brook University
2010	Staff Recruiting committee chair (Unix/Networking administrator), Computer Science Department, Stony Brook University
2010	Departmental 5-year Strategic Planning Committee member, Computer Science Department, Stony Brook University
2010	Faculty Recruiting Committee, Computer Science Department, Stony Brook University
2010	Staff Recruiting committee member (Network Administrator), CEWIT Center, Stony Brook University
2010	President's Teaching Excellence Award Selection Committee, Stony Brook University
2009	Staff Recruiting committee chair (Windows client administrator), Computer Science Department, Stony Brook University
2009	Staff Recruiting committee chair (CVC manager), Computer Science Department, Stony Brook University
2009–present	Advanced Energy Research and Technology Center (AERTC), scientific advisor board member, Stony Brook University
2009	President's Teaching Excellence Award Selection Committee, Stony Brook University
2007–2008	Staff Recruiting committee chair (webmaster), Computer Science Department, Stony Brook University

2008–present	New CS building committee, Computer Science Department, Stony Brook University
2007	Staff Recruiting committee chair (Unix administrator), Computer Science Department, Stony Brook University
2007–2010	Co-Chair, IT Operations committee, Computer Science Department, Stony Brook University
2006–present	Center of Excellence in Wireless and Information Technologies (CEWIT) faculty advisory board member, Computer Science Department, Stony Brook University
2006–2007	Chair, Resources and Facilities sub-committee, part of an 8-year departmental review committee. Computer Science Department, Stony Brook University.
2003–present	Visibility (Ranking) committee, Computer Science Department, Stony Brook University
2003–present	Graduate Committee, Computer Science Department, Stony Brook University
2003–present	Permanent Graduate Quals committee, Computer Science Department, Stony Brook University
2003–present	Center of Excellence in Wireless and Information Technologies (CEWIT) committee, Computer Science Department, Stony Brook University
2002–present	Web Site Design committee, Computer Science Department, Stony Brook University
2002–present	Operations Committee, Computer Science Department, Stony Brook University
2001–2006	Faculty Recruiting Committee, Computer Science Department, Stony Brook University
2002–2006	Graduate Recruiting Poster Committee, Computer Science Department, Stony Brook University
2005	SFS Program Director Recruiting committee, Computer Science Department, Stony Brook University
2004	Staff Recruiting committee, Computer Science Department, Stony Brook University
2004	Undergraduate Curriculum Review ad-hoc committee, Computer Science Department, Stony Brook University
2003	PI Award Interface (PIAI) Review committee, Stony Brook University
2003	Graduate Brochure committee, Computer Science Department, Stony Brook University
Spring 2002	Graduate Student Admissions committee, Computer Science Department, Stony Brook University
2002–2003	Graduate Quals Revisions committee, Computer Science Department, Stony Brook University
Spring 2002	Graduate Student Admissions Committee, Computer Science Department, Stony Brook University
Fall 2001	Undergraduate Curriculum Committee, Computer Science Department, Stony Brook University

Fall 2001	Domestic Graduate Student Recruiting Committee, Computer Science Department, Stony Brook University
Fall 2001	Quality of Life Committee, Computer Science Department, Stony Brook University
2001	Ph.D. and M.S. Recruiting Committee, Computer Science Department, Stony Brook University
1998–2000	Ph.D. Committee, Columbia University
1998–1999	Ph.D. Admissions Committee, Columbia University
1990–1999	Facilities Committee, Columbia University

Ph.D. Dissertation Defense Committee

Dec 2021	*Appearance Aware Visualization of High Dimensional Data*, Jenny Hyunjung Lee, Computer Science Department, Stony Brook University.
Aug 2020	Committee Chair, Muhammad Wajahat, *Cost-Efficient Dynamic Management of Cloud Resources via Supervised Learning*, Computer Science Department, Stony Brook University.
Jul 2019	Committee chair, *Analytical Approaches for Dynamic Scheduling in Cloud Environments*, Seyyed Ahmad Javadi, Computer Science Department, Stony Brook University.
Jan 2019	Adviser, *A Practical Auto-Tuning Framework for Storage Systems*, Zhen Cao, Computer Science Department, Stony Brook University.
Oct 2017	*Optimizing System Software with B^{ε} Trees*, William Jannen, Computer Science Department, Stony Brook University.
May 2017	Committee Chair, Yifeng Sun, *Protection Mechanisms for Virtual Machines on Virtualized Servers*, Computer Science Department, Stony Brook University.
Apr 2017	Adviser, *Kurma: Efficient and Secure Multi-Cloud Storage Gateways for Network-Attached Storage*, Ming Chen, Computer Science Department, Stony Brook University.
Sep 2014	Committee Chair, *Achieving Regulatory Compliance in Data Management*, Sumit Bajaj, Computer Science Department, Stony Brook University.
May 2014	Adviser, *GreenDM: A Versatile Tiering Hybrid Drive for the Trade-Off Evaluation of Performance, Energy, and Endurance*, Zhichao Li, Computer Science Department, Stony Brook University.
May 2014	Committee Chair, *Efficient Implementation Techniques for Block-Level Cloud Storage Systems* Dilip Simha, Computer Science Department, Stony Brook University.
Dec 2013	Adviser, *Multi-dimensional Workload Analysis and Synthesis for Modern Storage Systems*, Vasily Tarasov, Computer Science Department, Stony Brook University.
May 2012	Committee Chair, *Practical Oblivious Outsourced Data Processing*, Peter Williams, Computer Science Department, Stony Brook University.
Jan 2012	Adviser, *Efficient, Scalable, and Versatile Application and System Transaction Management for Direct Storage Layers*, Richard P. Spillane, Computer Science Department, Stony Brook University.

Aug 2009	*Virtualization Mechanisms for Mobility, Security and System Administration*, Shaya Potter, Computer Science Department, Columbia University.
Aug 2009	Adviser, *Flexible Debugging with Controllable Overhead*, Sean Callanan, Computer Science Department, Stony Brook University.
Sep 2008	Committee chair, *Repairable File and Storage Systems*, Ningning Zhu, Computer Science Department, Stony Brook University.
Aug 2008	Adviser, *Analyzing Root Causes of Latency Distributions*, Avishay Traeger, Computer Science Department, Stony Brook University.
Aug 2008	*Programmable Ethernet Switches and Their Applications*, Srikant Sharma, Computer Science Department, Stony Brook University.
May 2008	Committee chair, *Practical Information Flow Based Techniques to Safeguard Host Integrity"*, Weiqing Sun, Computer Science Department, Stony Brook University.
Feb 2008	Adviser, *End-to-End Abstractions for Application-Aware Storage*, Gopalan Sivathanu (advisee), Computer Science Department, Stony Brook University.
Dec 2006	Adviser, *Versatile, Portable, and Efficient File System Profiling*, Nikolai Joukov (advisee), Computer Science Department, Stony Brook University.
Jul 2006	Committee chair, *Availability, Fairness, and Performance Optimization in Storage Virtualization Systems*, Gang "Jason" Peng, Computer Science Department, Stony Brook University.
Jun 2006	*Implementation Techniques for Scalable, Secure and QoS-Guaranteed Enterprise-Grade Wireless LANs*, Fanglu Guo, Computer Science Department, Stony Brook University.
May 2006	Adviser, *Extending ACID Semantics to the File System via* `ptrace`, Charles P. Wright (advisee), Computer Science Department, Stony Brook University.
Aug 2002	*Authoring, Compression, and Playback of Active Video Content*, Anindya Neogi, Computer Science Department, Stony Brook University.

M.S. Thesis Defense Committee

May 2021	*Transfer Learning Techniques for Sequence Labeling in Network File System Specifications*, Amanpreet Singh, Computer Science Department, Stony Brook University.
Dec 2016	Adviser, *To FUSE or not to FUSE? Analysis and Performance Characterization of the FUSE User-Space File System Framework*, Bharath Kumar Reddy Vangoor, Computer Science Department, Stony Brook University.
May 2015	Adviser, *Finding the Right Balance: Security vs. Performance with Network Storage Systems*, Arun Olappamanna Vasudevan, Computer Science Department, Stony Brook University.
May 2012	Adviser, *A Context Aware Block Layer: The Case for Block Layer Deduplication*, Amar Mudrankit, Computer Science Department, Stony Brook University.
May 2012	Adviser, *From Tuples to Files: a Fast Transactional System Store and File System*, Pradeep Shetty, Computer Science Department, Stony Brook University.

December 2010 *TRACECUT: a mechanism of providing history based pointcuts on top of InterAspect*, Ketan Dixit, Computer Science Department, Stony Brook University.

May 2010 Adviser, *Stopping Data Races Using Redflag*, Abhinav Duggal, Computer Science Department, Stony Brook University.

May 2010 Adviser, *Optimizing Energy and Performance for Server-Class File System Workloads*, Priya Sehgal, Computer Science Department, Stony Brook University.

May 2010 *Model Checking the Kaminsky DNS Cache-Poisoning Attack Using PRISM*, Tushar Sudas Deshpande, Computer Science Department, Stony Brook University.

May 2010 Committee chair, *LFSM (Log Structured Flash Storage Manager)* Gautham Meruva, Computer Science Department, Stony Brook University.

Apr 2009 Adviser, *The Visual Development of GCC Plug-ins with GDE* Daniel J. Dean, Computer Science Department, Stony Brook University.

Apr 2009 Adviser, *Energy and Performance Evaluation of Lossless File Data Compression on Computer Systems* Rachita Kothiyal, Computer Science Department, Stony Brook University.

May 2007 Adviser, *PLEASE: Policy Language for Easy Administration of SELinux*, David P. Quigley, Computer Science Department, Stony Brook University.

Jun 2006 *Towards the Minimal TCP Offload Architecture*, Lakshmi Kumar Tiruppukuzhi, Computer Science Department, Stony Brook University.

Jun 2006 *An Approach to Protect System Integrity from Untrusted Applications*, Gaurav Poothia, Computer Science Department, Stony Brook University.

Dec 2005 Adviser, *Storage Virtualization with a Stackable File System*, Sunil Satnur, Computer Science Department, Stony Brook University.

Dec 2004 Adviser, *File System Extensibility and Reliability Using an in-Kernel Databases System*, Aditya Kashyap, Computer Science Department, Stony Brook University.

Aug 2004 Adviser, *Versatile File System Tracing with Tracefs*, Akshat Aranya, Computer Science Department, Stony Brook University.

Mar 2004 *System and Network Management Using State Machines*, Mohan-Krishna Channa-Reddy, Computer Science Department, Stony Brook University.

Dec 2003 Adviser, *Versionfs: A Versatile and User-Oriented Versioning File System*, Kiran-Kumar Muniswamy-Reddy (advisee), Computer Science Department, Stony Brook University.

Aug 2003 *WattProbe: Software-Based Empirical Extraction of Hardware Energy Models*, Manish Prasad, Computer Science Department, Stony Brook University.

Jun 2003 Adviser, *A System for Improving Application Performance Through System Call Composition*, Amit Purohit, Computer Science Department, Stony Brook University.

Ph.D. Thesis-Proposal (Prelim) Committee

Jun 2022 Adviser, *Using Machine Learning to Improve Operating Systems' I/O Subsystems*, Ibrahim "Umit" Akgun, Computer Science Department, Stony Brook University.

HULU EXHIBIT 1003
Page 36 of 73

Apr 2022	*Exploring Large Parameter Spaces with Machine Learning and Data Visualization*, Anjul Tyagi, Computer Science Department, Stony Brook University.
Apr 2019	*Cost-Efficient Dynamic Management of Cloud Resources through Supervised Learning*, Muhammad Wajahat, Computer Science Department, Stony Brook University.
Dec 2018	*Predicting the Future of Archival Storage Using Simulation*, James Byron, Computer Science Department, UC Santa Cruz.
Nov 2018	Committee chair, *Analytical Approaches for Dynamic Scheduling in Cloud Environments*, Seyyed Ahmad Javadi, Computer Science Department, Stony Brook University.
Jun 2018	Committee chair, *Appearance Aware Visualization of High Dimensional Data*, Jenny Hyunjung Lee, Computer Science Department, Stony Brook University.
Apr 2018	Adviser, *A Practical, Real-Time Auto-Tuning Framework for Storage Systems*, Zhen Cao, Computer Science Department, Stony Brook University.
Apr 2017	*Optimizing System Software with B^{ε} Trees*, William Jannen, Computer Science Department, Stony Brook University.
Nov 2015	Adviser, *KURMA: Geo-Distributed Secure Middlewares for Cloud-Backed Network Attached Storage*, Ming Chen, Computer Science Department, Stony Brook University.
Dec 2014	*Economic Modeling of Long-Term Digital Storage*, Preeti Gupta, Computer Science Department, the University of California at Santa Cruz.
Oct 2013	*Achieving Regulatory Compliance in Data Management*, Sumit Bajaj, Computer Science Department, Stony Brook University.
Aug 2013	Committee chair, *Implementation Techniques for Software-Defined Distributed Storage Systems*, Dilip Simha, Computer Science Department, Stony Brook University.
May 2013	Adviser, *System-Aware Resource Scheduling for Performance, Energy, and Reliability in Tiered Storage Systems*, Zhichao Li, Computer Science Department, Stony Brook University.
Apr 2013	Adviser, *Multi-dimensional Workload Analysis and Synthesis for Modern Storage Systems*, Vasily Tarasov, Computer Science Department, Stony Brook University.
Jan 2012	Adviser, *Runtime Verification of Kernel-Level Concurrency Using Compiler-Based Instrumentation*, Justin Seyster, Computer Science Department, Stony Brook University.
Aug 2011	Adviser, *Efficient, Scalable, and Versatile Application and System Transaction Management for Direct Storage Layers* Richard P. Spillane, Computer Science Department, Stony Brook University.
May 2011	*Practical Oblivious Outsourced Data Processing* Peter Williams, Computer Science Department, Stony Brook University.
Dec 2008	*Organizing, Indexing, and Searching Large-Scale File Systems* Andrew Leung, Computer Science Department, the University of California at Santa Cruz.
Mar 2008	Adviser, *Remote Debugging with Controllable Overhead* Sean Callanan, Computer Science Department, Stony Brook University.
Feb 2008	Adviser, *Analyzing Root Causes of Latency Distributions*, Avishay Traeger, Computer Science Department, Stony Brook University.

Oct 2007	*Practical Information Flow Based Techniques to Safeguard Host Integrity"*, Weiqing Sun, Computer Science Department, Stony Brook University.
Aug 2007	Committee chair, *OS-level Virtualization and Its Applications*, Yang Yu, Computer Science Department, Stony Brook University.
May 2007	Adviser, *End-to-End Abstractions for Application-Aware Storage*, Gopalan Sivathanu, Computer Science Department, Stony Brook University.
Jun 2006	*Building Enterprise-Grade Wireless LAN with High Mobility, Capacity and Security*, Fanglu Guo, Computer Science Department, Stony Brook University.
Apr 2006	Adviser, *Versatile, Portable, and Efficient File System Profiling*, Nikolai Joukov, Computer Science Department, Stony Brook University.
Jan 2006	Adviser, *Extending ACID Semantics to the File System*, Charles P. Wright, Computer Science Department, Stony Brook University.
Aug 2005	Committee chair, *Repairable File and Storage Systems*, Ningning Zhu, Computer Science Department, Stony Brook University.
Dec 2004	Committee chair, *Programmable Ethernet switch networks and their applications*, Srikant Sharma, Computer Science Department, Stony Brook University.
Sep 2004	Committee chair, *Availability Support and Performance Optimization in Stonehenge*, Gang "Jason" Peng, Computer Science Department, Stony Brook University.
Mar 2002	*Stonehenge: A High Performance Virtualized Storage Cluster With QoS Guarantees*, Lan Huang, Computer Science Department, Stony Brook University.
Oct 2001	*A System for Collaborative Web Resource Categorization and Ranking*, Maxim Lifantsev.
May 2001	*Authoring, Compression, and Playback of Active Video Content*, Anindya Neogi, Computer Science Department, Stony Brook University.

Ph.D. Research Proficiency Exam (RPE) Committee

Apr 2022	Committee chair, *Optimizing Near-Data Processing for Spark*, Sri Pramodh Rachuri, Computer Science Department, Stony Brook University.
Jan 2022	Adviser, *Model-Checking Support for File System Development*, Yifei Liu, Computer Science Department, Stony Brook University.
Aug 2020	*An Experimental Evaluation of Cache-Adaptive Algorithms*, Abiyaz Chowdhury, Computer Science Department, Stony Brook University.
May 2019	Adviser, *Re-Animator: Versatile High-Fidelity System-Call Tracing and Replaying* Ibrahim "Umit" Akgun, Computer Science Department, Stony Brook University.
Aug 2018	Committee chair, *Reducing tail latency in web applications by addressing variability in service times*, Amoghavarsha Suresh, Computer Science Department, Stony Brook University.
Apr 2018	Committee chair, *Realizing an Elastic Memcached via Cached Data Migration*, Ubaid Ullah Hafeez, Computer Science Department, Stony Brook University.

Sep 2016	Dynamic Interference-Aware Load Balancing, Seyyed Ahmad Javadi, Computer Science Department, Stony Brook University.
May 2016	Committee chair, *Leveraging Machine Learning for Black-Box Autoscaling*, Muhammad Wajahat, Computer Science Department, Stony Brook University.
Apr 2016	*Spatial Big Data Management and Analytics on Cloud environments and modern computing infrastructures* Hoang Vo, Computer Science Department, Stony Brook University.
Jan 2016	Adviser, *Parametric Optimization of Storage Systems* Zhen Cao, Computer Science Department, Stony Brook University.
Dec 2015	Adviser, *Design and Implementation of an Open-Source Deduplication Platform for Research* Sonam Mandal, Computer Science Department, Stony Brook University.
Sep 2012	*The Design and Application of Content Addressable Storage Systems*, William Jannen Computer Science Department, Stony Brook University.
Aug 2012	Committee chair, *Interaction for Visualization of Multidimensional Data*, Puripant Ruchikachorn, Computer Science Department, Stony Brook University.
Nov 2011	Committee chair, *Trusted Hardware in Secure Data Management*, Sumit Bajaj, Computer Science Department, Stony Brook University.
Sep 2011	Committee chair, *Isolated and Efficient Execution of Unmodified Network Device Drivers*, Yifeng Sun, Computer Science Department, Stony Brook University.
Sep 2011	Committee chair, *The Art of Data Deduplication*, DilipSimha N M, Computer Science Department, Stony Brook University.
Sep 2011	Adviser, *Power and Performance in Compression Systems: A Control Theoretical Approach with Evaluation*, Zhichao Li, Computer Science Department, Stony Brook University.
Sep 2011	Committee chair, *Isolated and Efficient Execution of Unmodified Network Device Drivers*, Sun Yifeng, Computer Science Department, Stony Brook University.
Sep 2011	*Defensive Techniques for Untrustworthy Operating Systems*, Committee chair, Rui Qiao, Computer Science Department, Stony Brook University.
Aug 2011	*Computational Modeling and Analysis of Cardiac Arrhythmia*, Abhishek Murthy, Computer Science Department, Stony Brook University.
Feb 2010	Adviser, *An End-to-End Performance Evaluation of NFSv4 Implementations*, Vasily Tarasov, Computer Science Department, Stony Brook University.
Aug 2009	*Attacks and Defenses: Unix File-System race conditions*, Xiang Cai, Computer Science Department, Stony Brook University.
Mar 2008	Adviser, *Techniques for Visualizing Software Execution*, Justin Seyster, Computer Science Department, Stony Brook University.
May 2006	Committee chair, *Challenges of Long-Term Digital Archiving*, Maohua Lu, Computer Science Department, Stony Brook University.
Feb 2006	*A Survey of Program Transformation Languages and Systems*, Michael Gorbovitski, Computer Science Department, Stony Brook University.

Jun 2005	*Peer to Peer File Download and Streaming*, Gang Wu, Computer Science Department, Stony Brook University.
May 2005	Adviser, *Debugging and Optimizing Systems With Runtime Instrumentation*, Sean Callanan, Computer Science Department, Stony Brook University.
May 2005	Adviser, *File System Benchmarking: Fallacies and Pitfalls*, Avishay Traeger, Computer Science Department, Stony Brook University.
May 2005	Adviser, *On the Role of Static Analysis in Operating System Checking and Runtime Verification*, Abhishek Rai, Computer Science Department, Stony Brook University.
May 2005	Adviser, *Ensuring Data Integrity in Storage: Techniques and Applications*, Gopalan Sivathanu, Computer Science Department, Stony Brook University.
Feb 2005	*A Survey on Virtualization Techniques*, Susanta Nanda, Computer Science Department, Stony Brook University.
Sep 2004	*Enterprise Digital Rights Management: Solutions against Information Theft by Insiders*, Yang Yu, Computer Science Department, Stony Brook University.
May 2004	Adviser, *Operating System Support for Extensible Secure File Systems*, Charles P. Wright, Computer Science Department, Stony Brook University.
Feb 2004	*Traffic Analysis: From Stateful Firewall to Network Intrusion Detection System*, Fanglu Guo, Computer Science Department, Stony Brook University.
Feb 2004	*Damage Recovery from Malicious Code and Operator Errors*, Weiqing Sun, Computer Science Department, Stony Brook University.
Sep 2003	Adviser, *Internet Worms as Internet-Wide Threat*, Nikolai Joukov, Computer Science Department, Stony Brook University.
Mar 2003	*Cache Oblivious Algorithms: Theory and Practice*, Piyush Kumar, Computer Science Department, Stony Brook University.
Jan 2003	Committee chair, *CDN: Content Distribution Network*, Gang "Jason" Peng, Computer Science Department, Stony Brook University.
Aug 2001	*Pattern Based Intrusion Detection Systems*, Prem Uppuluri, Computer Science Department, Stony Brook University.

Other One-Time Committee Service

2019	Office of Vice-President for Research, Seed Grant review committee Bi-annual Awards committee, Stony Brook University.
Aug 2012	Bi-annual Awards committee, Computer Science Department, Stony Brook University.
Nov 2011	Member, Steering Committee on High-Performance Computing, Stony Brook University and Brookhaven National Labs.
Oct 2010	Annual Merit Raise committee, Computer Science Department, Stony Brook University.
Aug 2010	Bi-annual Awards committee, Computer Science Department, Stony Brook University.
Oct 2009	Annual Merit Raise committee, Computer Science Department, Stony Brook University.

Sep 2008	Annual Merit Raise committee, Computer Science Department, Stony Brook University.
Sep 2007	Annual Merit Raise committee, Computer Science Department, Stony Brook University.
Jan 2007	Examiner for CS Ph.D. Qualifying Exams, Computer Science Department, Stony Brook University.
Jul 2006	Bi-annual Awards committee, Computer Science Department, Stony Brook University.
Apr 2006	Judge, *Compilers* session. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.
Sep 2005	Annual Merit Raise committee, Computer Science Department, Stony Brook University.
Aug 2005	Ad-hoc Steering Committee on Strategic Planning, Computer Science Department, Stony Brook University.
May 2004	Judge, *Security* session. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.
May 2004	Examiner for CS Ph.D. Qualifying Exams, Computer Science Department, Stony Brook University.
Jan 2004	Examiner for CS Ph.D. Qualifying Exams, Computer Science Department, Stony Brook University.
May 2003	Judge, *Security* session. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.
Oct 2003	Ph.D. qualifying exam chair (Hardware exam), Computer Science Department, Stony Brook University.
Oct 2003	Examiner for CS Ph.D. Qualifying Exams, Computer Science Department, Stony Brook University.
May 2003	Examiner for CS Ph.D. Qualifying Exams, Computer Science Department, Stony Brook University.
May 2002	Examiner for CS Ph.D. Qualifying Exams, Computer Science Department, Stony Brook University.
May 2001	Examiner for CS Ph.D. Qualifying Exams, Computer Science Department, Stony Brook University.

Other Departmental Service

2008–present	Course Coordinator, Systems Administration, (ISE-311)
2003–present	Course Coordinator, Introduction to Programming in C (CSE-130)
2002–present	Course Coordinator, Advanced Systems Programming in Unix/C (CSE-376)
2001–present	Course Coordinator, Operating Systems (CSE-506)
2003–2005	Course Coordinator, Intermediate Programming in C and C++ (CSE-230)

HULU EXHIBIT 1003
Page 41 of 73

Community Work

Nov 2008	"How Computers Work," guest speaker at Mount Elementary 4th grade (teacher: Jo-Ann Hudecek), Stony Brook Three Village School District, Stony Brook, NY.
2003	Stony Brook Child Care Services Inc. (SBCCSI), fund-raising committee member
2002–present	Faculty sponsor of the Stony Brook Linux Users Group (SBLUG)
1997–present	Maintainer of FiST, a stackable file system template system
1992–present	Maintainer of Amd, the Berkeley Automounter (am-utils)

Shepherding

2016–2017	The 15th USENIX Conference on File and Storage Technologies (FAST '17) (1 paper)
2011	The 2011 Usenix Annual Technical Conference (Usenix ATC 2011) (1 paper)
2009	The 2009 ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 2009) (2 papers)
2009	Fifth USENIX Conference on File and Storage Technologies (FAST '09) (1 paper)
2007	USENIX FAST Annual Conference (2 papers)
2003	USENIX FreeNIX Annual Conference (2 papers)
2002	USENIX FreeNIX Annual Conference (4 papers)
2001	First USENIX Conference on File and Storage Technologies (FAST '02) (1 paper)

Software Released or Maintained

2010–present	Wrapfs Stackable File System for Linux
2007–present	GCC Plugin Infrastructure.
2005–present	Auto-Pilot: A Suite of Tools for Conducting Benchmarks, `www.filesystems.org/project-autopilot.html`
2004–present	Unionfs: A Stackable Unification File System, `https://unionfs.filesystems.org`. (As of January 2007, Unionfs has been a part of Andrew Morton's Linux Kernel source tree. Andrew is the person in charge of supplying new patches to Linus Torvalds for new kernel releases, therefore Unionfs is on its way to becoming a part of the Linux kernel.)
1997–present	FiST: Stackable File System Language and Templates, `www.filesystems.org/`
1992–present	Am-Utils: The Berkeley Automounter Suite of Utilities, `www.am-utils.org`
2004–2005	I^3FS: In-Kernel Integrity Checker and Intrusion Detection File System, `www.fsl.cs.sunysb.edu/project-i3fs.html`
2003–2004	KBDB: In-Kernel Berkeley DB Databases NFScrack: NFS File Handle Security, KBDBFS: File System Extensibility and Reliability Using an in-Kernel Database, `www.fsl.cs.sunysb.edu/project-kbdb.html`
2002	ENF: Enhancing NFS Cross-Administrative Domain Access, `ftp://ftp.fsl.cs.sunysb.edu/pub/enf/`

HULU EXHIBIT 1003
Page 42 of 73

1999 PGmake: Parallel GNU Make, `www.fsl.cs.sunysb.edu/project-pgmake.html`

TALKS

Invited Talks

May 2017 *Oh, what a tangled web we weave: practice and deception in system analysis*, Performance Evaluation and Analysis Meetup, IBM Research–Haifa, Haifa, Israel.

May 2017 *vNFS: Maximizing NFS Performance with Compounds and Vectorized I/O*, ACM SYSTOR 2017 (highlights paper track), Haifa, Israel.

Feb 2017 *Oh, what a tangled web we weave: practice and deception in system analysis*, Tintri, Inc., Mountain View, CA.

Dec 2016 *Oh, what a tangled web we weave: practice and deception in system analysis*, Harvey Mudd College, Claremont, CA.

Jun 2016 *Oh, what a tangled web we weave: practice and deception in system analysis* Keynote address at inaugural workshop: The 1st International Workshop on System Analytics and Characterization (SAC'16, co-located with ACM SIGMETRICS), Antibes Juan-Les-Pins, France.

Feb 2016 *Parametric Optimization of Storage Systems*, VMware Inc., Palo Alto, CA.

Feb 2006 *File System and Storage Benchmarking: On Formalizing Filebench Workloads*, a Birds-of-Feather (BoF) talk presented at the 2016 Usenix FAST conference, Santa Clara, CA.

Jun 2012 *Storage Security Overview*, CA/CEWIT center inauguration workshop, Tel Aviv University, Tel Aviv, Israel.

May 2012 *Synthesizing Realistic Workload Models and Dedup Datasets*, IBM Haifa Research Labs, Tel Aviv, Israel.

May 2012 *Optimizing Performance and Energy Use of Large Data Systems*, NSF Industry/University Center (I/UCRC) for Dynamic Data Analytics (CDDA) 2012 workshop, Stony Brook, NY.

Feb 2012 *Scaling OS Storage Stack Performance Using NVRAM Technologies*, Fusion-io, San Jose, CA

Nov 2011 *Scaling and Understanding Large Data I/O Performance*, NSF Industry/University Center (I/UCRC) for Dynamic Data Analytics (CDDA) 2011 workshop, Rutgers, NJ.

Nov 2011 *Scaling I/O Performance for Large Data Sets*, 2011 CEWIT Center Conference, Hauppauge, NY.

Nov 2011 *Scaling OS Storage Stack Performance Using NVRAM Technologies*, Operating System Support for Next Generation Large Scale NVRAM (NVRAMOS'11), Jeju Island, South Korea.

Aug 2011 *Optimizing Server Performance and Energy*, High-End Computing Filesystems and I/O Workshop (HEC FSIO 2011), Arlington, VA.

May 2011 *On the Energy Consumption and Performance of Systems Software*, The 4th Israeli Experimental Systems Conference (ACM SYSTOR '11), Haifa, Israel.

HULU EXHIBIT 1003
Page 43 of 73

Feb 2011	*FSL Storage Research Overview*, Riverbed, Inc, Menlo Park, CA.
Nov 2010	*Server-Class Energy and Performance Evaluations, or, Mommy, Daddy, where did my Joules go?*, An SBCS Faculty Symposium series talk, sponsored by the Stony Brook Computer Society's ACM Chapter. Stony Brook University, Computer Science Department, Stony Brook, NY.
May 2010	*Server-Class Energy and Performance Evaluations*, The Third Israeli Experimental Systems Conference (ACM SYSTOR '10), Haifa, Israel.
Feb 2010	*On the Science of Power Management: Encouraging Sustainability R&D*, First USENIX Workshop on Sustainable Information Technology (SustainIT'10), San Jose, CA.
Feb 2010	*FSL Research Overview*, Data Domain, Inc, Santa Clara, CA.
Nov 2009	Priya Sehgal and Erez Zadok, *Improving Energy & Performance For Server Workloads*, The third Advanced Energy Research & Technology Center (AERTC) conference, Hauppauge, NY.
July 2009	*Energy and Performance Characterization of Storage Stacks*, IBM Watson Research Labs, Hawthorne, NY.
May 2009	*DHIS: Discriminating Hierarchical Storage*, The Israeli Experimental Systems Conference (ACM SYSTOR '09), Haifa, Israel.
May 2009	*Energy and Performance Evaluation of Lossless File Data Compression on Server Systems*, The Israeli Experimental Systems Conference (ACM SYSTOR '09), Haifa, Israel.
February 2009	*How to Cheat in Benchmarking*, a Birds-of-Feather (BoF) talk presented at the 2009 Usenix FAST conference, San Francisco, CA.
Nov 2008	*Mommy, Daddy, Why is My New Laptop So Dog Slow?!*, Parents' Day lecture, Stony Brook University, Stony Brook, NY.
May 2007	*Why is my new laptop so dog slow?!*, An SBCS Faculty Symposium series talk, sponsored by the Stony Brook Computer Society's ACM Chapter. Stony Brook University, Computer Science Department, Stony Brook, NY.
July 2006	*Securing Applications using Operating System Transactions*, Center for Information Protection, NSF I/UCRC organizational workshop, Stony Brook, NY.
June 2006	*Adding security to file systems, one layer at a time*, IBM's Storage Systems Strategy meeting, Mountain View, CA.
June 2006	*File System Benchmarking: Fallacies, Pitfalls, and Beyond*, VMware, Inc., Palo Alto, CA.
December 2005	*File System Benchmarking and Tools: Past, Present, and Future*, a Birds-of-Feather (BoF) talk presented at the 2006 Usenix FAST conference, San Francisco, CA.
December 2005	*File System Benchmarking: Fallacies, Pitfalls, and Beyond*, Penn State University, Computer Science Department, State College, PA.
October 2005	*File System Benchmarking: Fallacies, Pitfalls, and Beyond*, IBM Watson Research Labs, Hawthorne, NY.

October 2005	*File System Benchmarking: Fallacies, Pitfalls, and Beyond*, CSE-600 talk, Stony Brook University, Computer Science Department, Stony Brook, NY.
September 2005	*File System Benchmarking: Fallacies, Pitfalls, and Beyond*, UC Santa Cruz, Computer Science Department, Santa Cruz, California.
June 2005	*Adding security to file systems, one layer at a time*, Second Security Summit, Storage Networking Industry Association (SNIA), Pittsburgh, Pennsylvania
May 2005	*File System Security*, 35th Anniversary Celebration, Stony Brook University, Computer Science Department (CS@35), Stony Brook, New York
April 2005	*Efficient and Safe Execution of User-Level Code in the Kernel*, the 2005 NSF Next Generation Software Workshop, in conjunction with the 2005 International Parallel and Distributed Processing Symposium (IPDPS), Denver, Colorado
October 2004	*File System and OS Security*, talk given to Korean delegation led by Dr. Ho, Stony Brook University, Stony Brook, New York
October 2004	*File System and OS Security*, Computer Associates, Islandia, New York
June 2003	*ASK: Active Spam Killer*, Annual Usenix Conference, FREENIX Track, San Antonio, Texas
February 2003	*File System Security*, New York State Cyber-Security Symposium, Utica, New York
April 2000	*FiST: A System for File System Code Generation*, Computer Science Department, University of Chicago
March 2000	*FiST: A System for File System Code Generation*, Computer Science Department, University of Rochester
March 2000	*FiST: A System for File System Code Generation*, Computer Science Department, Stony Brook University
March 2000	*FiST: A System for File System Code Generation*, Computer Science Department, University of California and Santa Barbara
March 2000	*FiST: A System for File System Code Generation*, Computer Science Department, Penn State University
February 2000	*FiST: A System for File System Code Generation*, Computer Science Department, Bell Labs, New Jersey

Interviews

November 4, 2005	LIA magazine, with Ellen Sterling; what small businesses can do to protect themselves.
June 29, 2001	Dr. Dobb's Technetcast, with Phillippe Lourier; my NFS and Automounters book, status of Linux file system development.

Other Presentations

Mar 2012	Erez Zadok, Steering Committee Town Hall meeting, presenting Google Apps for Education, Stony Brook University.
Feb 2012	Daniel C. Rosenthal, University of California, Santa Cruz; David S. H. Rosenthal, Stanford University Libraries; Ethan L. Miller and Ian F. Adams, University of California,

HULU EXHIBIT 1003
Page 45 of 73

Santa Cruz; Mark W. Storer, NetApp; Erez Zadok, Stony Brook University. *Toward an Economic Model of Long-Term Storage* WIP presented at the *Tenth USENIX Conference on File and Storage Technologies (FAST '12)*, San Jose, CA.

Feb 2012 — Zhichao Li, Stony Brook University; Kevin M. Greenan and Andrew W. Leung, EMC Corporation; Erez Zadok, Stony Brook University. *Power Consumption in Enterprise-Scale Backup Storage Systems* Poster presented at the *Tenth USENIX Conference on File and Storage Technologies (FAST '12)*, San Jose, CA.

Feb 2012 — V. Tarasov and S. Kumar, Stony Brook University; J. Ma, Harvey Mudd College; D. Hildebrand and A. Povzner, IBM Almaden Research; G. Kuenning, Harvey Mudd College; E. Zadok, Stony Brook University *Extracting Flexible, Replayable Models from Large Block Traces* Poster presented at the *Tenth USENIX Conference on File and Storage Technologies (FAST '12)*, San Jose, CA.

Nov 2011 — Zhichao Li, R. Grosu, S. A. Smolka, S. D. Stoller, and E. Zadok, Stony Brook University. *Power and Performance in Compression Systems: A Control Theoretical Approach with Evaluation* Poster presented at the *Eighth CEWIT conference (CEWIT '11)*, Hauppauge, NY.

Oct 2011 — Zhichao Li, R. Grosu, S. A. Smolka, S. D. Stoller, and E. Zadok, Stony Brook University. *Power and Performance in Compression Systems: A Control Theoretical Approach with Evaluation* Poster presented at the *Fifth AERTC conference (AERTC '11)*, Buffalo, NY.

May 2011 — Vasily Tarasov, Koundinya Santhosh Kumar, and Erez Zadok, Stony Brook University; Geoff Kuenning, Harvey Mudd College. *T2M: Converting I/O Traces to Workload Models*, Poster presented at the *13th USENIX Workshop on Hot Optics in Operating Systems (HotOS '11)*, Napa, CA.

Feb 2011 — Vasily Tarasov, Koundinya Santhosh Kumar, and Erez Zadok, Stony Brook University; Geoff Kuenning, Harvey Mudd College. *T2M: Converting I/O Traces to Workload Models*, WIP and Poster presented at the *Ninth USENIX Conference on File and Storage Technologies (FAST '11)*, San Jose, CA.

Feb 2011 — Erez Zadok, Stony Brook University and Geoff Kuenning, Harvey Mudd College. *Benchmarking and Tracing: New Horizons*, Birds-of-a-feather (BOF) presented at the *Ninth USENIX Conference on File and Storage Technologies (FAST '11)*, San Jose, CA.

Oct 2011 — Justin Seyster, Abhinav Duggal, Prabakar Radhakrishnan, Scott D. Stoller, and Erez Zadok, Stony Brook University. *Redflag: Detailed Runtime Analysis of Kernel-Level Concurrency*, Poster presented at the *9th USENIX Symposium on Operating Systems Design and Implementations (OSDI '10)*, Vancouver, BC, Canada.

Feb 2010 — Vasily Tarasov, Sujay Godbole, and Erez Zadok. *NSFv4 Implementations: Who Performs Better, When, and Why*, poster presented at the *Eighth USENIX Conference on File and Storage Technologies (FAST '10)*, San Jose, CA.

Feb 2010 — Rick Spillane and Erez Zadok. *Down with the VFS and His Insidious Caches!*, WIP presented at the *Eighth USENIX Conference on File and Storage Technologies (FAST '10)*, San Jose, CA.

Jan 2010 — Erez Zadok and Radu Sion. *Energy and Cost Analysis of Cloud Computing*, NSF

Industry/University Center (I/UCRC) for Dynamic Data Analytics (CDDA) planning workshop, New York, NY.

Oct 2009 — Priya Sehgal, Vasily Tarasov, and Erez Zadok. *Server Energy and Performance Evaluations*, poster presented at the *2009 CEWIT Center Conference*, Islandia, NY.

Dec 2008 — Rick Spillane, Chaitanya Yalamanchili, Sachin Gaikwad, Manjunath Chinni, and Erez Zadok. *Honor: A Serializing On-Disk Writeback Buffer*. WIP presented at the *Eighth Symposium on Operating Systems Design and Implementation (OSDI '08)*, San Diego, CA.

Mar 2007 — D. Dean, S. Callanan, and E. Zadok. *Developing GCC Transformations Faster with Gimple Viz* Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

Mar 2007 — J. Seyster, S. Callanan, R. Grosu, S. Smolka, and E. Zadok. *Memcov A High Performance Memory Profiling Tool*. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

Mar 2007 — R. Spillane and E. Zadok. *A Lot for a Little: Transactional File Systems*. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

Apr 2006 — R. Spillane, C. P. Wright, and E. Zadok, *Goanna* (Best Paper Award), Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

Apr 2006 — N. Joukov, H. Papaxenopoulos, and E. Zadok, *Secure Deletion Myths, Issues, and Solutions*. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

Sep 2005 — E. Zadok, *A Layered Approach to Securing File Systems*, poster presented at the NSF CyberTrust PI meeting, Newport Beach, CA.

Oct 2005 — N Joukov, R. Iyer, A. Traeger, C. P. Wright, and E. Zadok. Versatile, Portable, and Efficient OS Profiling via Latency Analysis. Poster presented at the *20th ACM Symposium on Operating Systems Principles (SOSP'05)*, Brighton, UK.

Jul 2005 — D. Quigley, C. P. Wright, and E. Zadok. *UnionFS: Namespace Management*. Cyber Corps Summer Symposium 2005, Syracuse, New York.

Apr 2005 — D. Quigley, C. P. Wright, and E. Zadok. *UnionFS*. URECA (undergraduate research) presentation at Stony Brook.

Aug 2004 — Y. Miretskiy, A. Das, C. P. Wright, and E. Zadok. Avfs: An On-Access Anti-Virus File System. Poster presented at the *Workshop on Information Assurance Education* (WIAED 2004), Stony Brook University

Aug 2004 — C. P. Wright, M. C. Martino, and E. Zadok. NCryptfs: A Secure and Convenient Cryptographic File System. Poster presented at the *Workshop on Information Assurance Education* (WIAED 2004), Stony Brook University

May 2004 — P. Gupta, H. Krishnan, C. P. Wright, and E. Zadok. Versatility and Unix Semantics in a Fan-Out Unification File System. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

May 2004 — A. Kashyap, J. Dave, H. Krishnan, C. P. Wright, M. Nayyer Zubair, and E. Zadok.

Using Berkeley DB in the Linux Kernel. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

May 2004 — Y. Miretskiy, A. Das, C. P. Wright, and E. Zadok. Avfs: An On-Access Anti-Virus File System (Best Paper Award). Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

May 2004 — A. Aranya, C. P. Wright, and E. Zadok Tracefs: A File System to Trace Them All. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University

Apr 2004 — C. P. Wright and E. Zadok. A Stackable Smorgasbord. Poster presented at the *Third USENIX Conference on File and Storage Technologies (FAST '04)*, San Francisco, CA.

Apr 2004 — C. P. Wright and E. Zadok. *Avfs: An On-Access Anti-Virus File System* WIP presented at the *Third USENIX Conference on File and Storage Technologies (FAST '04)*, San Francisco, CA.

Apr 2004 — K. Muniswamy-Reddy, and E. Zadok. Elastic Quotas. Poster presented at the *12th NASA Goddard, 21st IEEE Conference on Mass Storage Systems and Technologies (MSST 2004)*, College Park, MD.

Nov 2003 — C. P. Wright and E. Zadok. Secure and Mobile File Systems. Poster presented at the *CEWIT 2003* conference, Woodbury, NY.

June 2003 — P. Gupta, H. Krishnan, K. Muniswamy-Reddy, C. P. Wright, and E. Zadok. Unionfs: A Flexible, and Portable Unioning File System. WIP presented at the *Annual USENIX Technical Conference*, San Antonio, TX.

June 2003 — A. Himmer, K. Muniswamy-Reddy, C. P. Wright, and E. Zadok. Versionfs: A Transparent and Portable Versioning File System. WIP presented at the *Annual USENIX Technical Conference*, San Antonio, TX.

May 2003 — A. Himmer and E. Zadok. Versionfs: A Transparent and Portable Versioning File System. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

May 2003 — E. Zadok, J. Osborn, A. Shater, C. P. Wright, K. Muniswamy-Reddy, and J. Nieh. Elastic Quotas: Stretch Your Disk Space. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

May 2003 — C. P. Wright, M. C. Martino, and E. Zadok. NCryptfs: A Secure and Convenient Cryptographic File System. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

May 2003 — A. Purohit, C. P. Wright, J. Spadavecchia, and E. Zadok. Cosy: Develop in User-Land, Run in Kernel-Mode. Graduate Research Conference (GRC), Computer Science Department, Stony Brook University.

April 2003 — M. Prasad and E. Zadok. Transparent Page Cache Coherence Support for Linux-based Stackable File Systems. WIP presented at the *Second USENIX Conference on File and Storage Technologies (FAST '03)*, San Francisco, CA.

Fall 2002 — E. Zadok. Linux Kernel Internals. Guest lecture in CSE-306.

December 2002 — A. Purohit, J. Spadavecchia, C. Wright, and E. Zadok. Improving Application Performance Through System Call Composition WIP presented at the *Fifth Symposium on Operating Systems Design and Implementation (OSDI '02)*, Boston, MA.

December 2002 — C. Wright, M. Martino, and E. Zadok. NCryptfs: A Secure and Convenient Cryptographic File System. WIP presented at the *Fifth Symposium on Operating Systems Design and Implementation (OSDI '02)*, Boston, MA.

December 2002 — E. Zadok, J. Osborn, C. P. Wright, K. Muniswamy-Reddy. Elastic Quotas. WIP presented at the *Fifth Symposium on Operating Systems Design and Implementation (OSDI '02)*, Boston, MA.

June 2002 — A. Purohit, J. Spadavecchia, C. Wright, and E. Zadok. Improving Application Performance Through System Call Composition. WIP presented at the *Annual USENIX Technical Conference*, Monterey, CA.

June 2002 — O. C. Leonard, J. Nieh, E. Zadok, J. Osborn, A. Shater, and C. Wright. The Design and Implementation of Elastic Quotas: A System for Flexible File System Management. WIP presented at the *Annual USENIX Technical Conference*, Monterey, CA.

January 2002 — J. Spadavecchia and E. Zadok. Enhancing NFS Cross-Administrative Domain Access. WIP presented at the *First USENIX Conference on File and Storage Technologies (FAST '02)*, Monterey, CA.

December 1999 — E. Zadok and J. Nieh. FiST: A Language for Stackable File Systems. Poster presented at the *17th ACM Symposium on Operating Systems Principles (SOSP)*, Kiawah Island, SC.

TEACHING

Instructor

Spring 2022 — Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University

Spring 2022 — Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University

Spring 2022 — Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University

Spring 2022 — Advanced Project in Computer Science I (CSE-524), Computer Science Department, Stony Brook University

Spring 2022 — Graduate Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University

Spring 2022 — Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University

Fall 2021 — Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University

Fall 2021 — Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University

HULU EXHIBIT 1003
Page 49 of 73

Fall 2021	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2021	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2021	Seminar in Concurrency (CSE-643), Computer Science Department, Stony Brook University
Fall 2021	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2021	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2021	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Spring 2021	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2021	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Spring 2021	Advanced Project in Computer Science I (CSE-524), Computer Science Department, Stony Brook University
Spring 2021	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2021	Graduate Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Spring 2021	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2020	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University
Fall 2020	Senior Honors Research Project II (CSE-499), Computer Science Department, Stony Brook University
Fall 2020	Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2020	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2020	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2020	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University
Summer 2020	Senior Honors Research Project I (CSE-495), Computer Science Department, Stony Brook University

Summer 2020	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Spring 2020	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2020	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Spring 2020	Advanced Project in Computer Science I (CSE-524), Computer Science Department, Stony Brook University
Spring 2020	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2020	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2019	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Fall 2019	Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2019	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2019	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2019	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2019	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Spring 2019	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2019	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Spring 2019	Advanced Project in Computer Science I (CSE-524), Computer Science Department, Stony Brook University
Spring 2019	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2019	Graduate Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Winter 2019	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2018	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University

Fall 2018	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Fall 2018	Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2018	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2018	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2018	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Summer 2018	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2018	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Spring 2018	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University
Spring 2018	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2018	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Spring 2018	Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2018	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2018	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2017	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Fall 2017	Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2017	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2017	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Summer 2017	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2017	Internship in Research (CSE-696), Computer Science Department, Stony Brook University

Spring 2017	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2017	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Spring 2017	Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2017	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2016	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2016	Advanced Project in Computer Science I (CSE-523), Computer Science Department, Stony Brook University
Fall 2016	Advanced Project in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2016	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2016	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2016	Graduate Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2016	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2016	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2016	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Spring 2016	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2016	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University
Spring 2016	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2016	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2016	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2016	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University

Fall 2015	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2015	Senior Honors Research Project II (CSE-496), Computer Science Department, Stony Brook University
Fall 2015	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Fall 2015	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2015	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2015	Graduate Teaching Practicum (CSE-698), Computer Science Department, Stony Brook University
Fall 2015	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2015	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2015	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Spring 2015	Topics in Computer Science: Storage Systems (CSE-593), Computer Science Department, Stony Brook University
Spring 2015	Senior Honors Research Project I (CSE-495), Computer Science Department, Stony Brook University
Spring 2015	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2015	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2015	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2015	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2015	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2014	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Fall 2014	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Fall 2014	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University

Fall 2014	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2014	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2014	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2014	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2014	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Spring 2014	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2014	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2014	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2014	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2014	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2013	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Fall 2013	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Fall 2013	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2013	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2013	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2013	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2013	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Summer 2013	FT Summer Research (CSE-800), Computer Science Department, Stony Brook University
Spring 2013	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University

Spring 2013	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2013	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2013	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2013	Topics in Computer Science: Storage Systems (CSE-595), Computer Science Department, Stony Brook University
Spring 2013	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2012	*Operating Systems* (CSE-306), Computer Science Department, Stony Brook University
Fall 2012	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Fall 2012	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2012	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2012	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2012	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2012	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Summer 2012	FT Summer Research (CSE-800), Computer Science Department, Stony Brook University
Spring 2012	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2012	Special Project in Computer Science (CSE-522), Computer Science Department, Stony Brook University
Spring 2012	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2012	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2012	Topics in Computer Science: Storage Systems (CSE-595), Computer Science Department, Stony Brook University.
Spring 2012	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2012	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University

Fall 2011	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Fall 2011	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2011	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2011	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2011	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2011	Information Systems Internship (ISE-488), Computer Science Department, Stony Brook University
Summer 2011	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2011	Internship in Research (CSE-696), Computer Science Department, Stony Brook University
Spring 2011	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2011	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2011	*M.S. Thesis Research* (CSE-599), Computer Science Department, Stony Brook University
Spring 2011	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2010	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2010	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2010	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2010	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2010	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2010	M.S. Internship in Research (CSE-596), Computer Science Department, Stony Brook University
Summer 2010	Internship in Research (CSE-696), Computer Science Department, Stony Brook University

Summer 2010	FT Summer Research (CSE-800), Computer Science Department, Stony Brook University
Spring 2010	Systems Administration (CSE-311), Computer Science Department, Stony Brook University
Spring 2010	Systems Administration (ISE-311), Computer Science Department, Stony Brook University
Spring 2010	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2010	*M.S. Thesis Research* (CSE-599), Computer Science Department, Stony Brook University
Spring 2010	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Spring 2010	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2009	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2009	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2009	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2009	*M.S. Thesis Research* (CSE-599), Computer Science Department, Stony Brook University
Fall 2009	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2009	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Spring 2009	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2009	Undergraduate Teaching Practicum (CSE-475), Computer Science Department, Stony Brook University
Spring 2009	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2009	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2009	Proficiency Requirement in Computer Science (CSE-587), Computer Science Department, Stony Brook University
Spring 2009	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University

HULU EXHIBIT 1003
Page 58 of 73

Spring 2009	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2009	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2008	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2008	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2008	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2008	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2008	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2008	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2008	FT Summer Research (CSE-800), Computer Science Department, Stony Brook University
Spring 2008	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2008	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2008	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2008	Proficiency Requirement in Computer Science (CSE-587), Computer Science Department, Stony Brook University
Spring 2008	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2008	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Spring 2008	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2007	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2007	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Fall 2007	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University

Fall 2007	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2007	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2007	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2007	FT Summer Research (CSE-800), Computer Science Department, Stony Brook University
Spring 2007	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2007	Undergraduate Teaching Practicum (CSE-475), Computer Science Department, Stony Brook University
Spring 2007	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2007	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2007	Topics in Computer Science: Secure Storage (CSE-590), Computer Science Department, Stony Brook University. Co-taught with Prof. Radu Sion.
Spring 2007	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2007	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2007	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2006	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2006	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Fall 2006	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2006	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2006	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2006	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Summer 2007	FT Summer Research (CSE-800), Computer Science Department, Stony Brook University

HULU EXHIBIT 1003
Page 60 of 73

Spring 2006	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2006	Topics in Computer Science: File Systems (CSE-594), Computer Science Department, Stony Brook University
Spring 2006	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2006	Proficiency Requirement in Computer Science (CSE-587), Computer Science Department, Stony Brook University
Spring 2006	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2006	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2005	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2005	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2005	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2005	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2005	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2005	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Spring 2005	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University
Summer 2005	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Summer 2005	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Summer 2005	FT Summer Research (CSE-800), Computer Science Department, Stony Brook University
Spring 2005	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Spring 2005	Advanced Operating Systems (CSE-624), Computer Science Department, Stony Brook University
Spring 2005	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University

HULU EXHIBIT 1003
Page 61 of 73

Spring 2005	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Spring 2005	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2005	Proficiency Requirement in Computer Science (CSE-587), Computer Science Department, Stony Brook University
Spring 2005	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2005	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2004	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Fall 2004	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2004	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2004	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Fall 2004	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Spring 2004	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2004	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2004	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Spring 2004	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2004	Practicum in Teaching (CSE-698), Computer Science Department, Stony Brook University
Spring 2004	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2003	Advanced Systems Programming in Unix/C (CSE-376), Computer Science Department, Stony Brook University
Fall 2003	Introduction to Software Engineering and Project Plan (CSE-523), Computer Science Department, Stony Brook University
Fall 2003	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University

Fall 2003	Proficiency Requirement in Computer Science (CSE-587), Computer Science Department, Stony Brook University
Fall 2003	Independent Study in Computer Science (CSE-593), Computer Science Department, Stony Brook University
Fall 2003	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Summer 2003	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University
Summer 2003	Intro to Software Engineering (CSE-523), Computer Science Department, Stony Brook University
Spring 2003	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2003	Senior Honors Research Project II (CSE-496), Computer Science Department, Stony Brook University
Spring 2003	Intro to Software Engineering (CSE-523), Computer Science Department, Stony Brook University
Spring 2003	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Spring 2003	Independent Study in Computer Science (CSE-587), Computer Science Department, Stony Brook University
Spring 2003	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2003	Graduate Teaching Practicum (CSE-698), Computer Science Department, Stony Brook University
Fall 2002	Advanced Systems Programming in Unix/C (CSE-376), new course developed, Computer Science Department, Stony Brook University
Fall 2002	Senior Honors Research Project I (CSE-495), Computer Science Department, Stony Brook University
Fall 2002	Intro to Software Engineering (CSE-523), Computer Science Department, Stony Brook University
Fall 2002	Lab in Computer Science II (CSE-524), Computer Science Department, Stony Brook University
Fall 2002	Independent Study in Computer Science (CSE-587), Computer Science Department, Stony Brook University
Fall 2002	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Summer 2002	Intro to Software Engineering (CSE-523), Computer Science Department, Stony Brook University

Spring 2002	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2002	Undergraduate Teaching Practicum (CSE-475), Computer Science Department, Stony Brook University
Spring 2002	Research in Computer Science (CSE-487), Computer Science Department, Stony Brook University
Spring 2002	Intro to Software Engineering (CSE-523), Computer Science Department, Stony Brook University
Spring 2002	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Spring 2002	Internship in Research (CSE-698), Computer Science Department, Stony Brook University
Spring 2002	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Fall 2001	*Special Topics in Software Engineering: Systems Programming* (CSE/ISE-391), Computer Science Department, Stony Brook University
Fall 2001	M.S. Thesis Research (CSE-599), Computer Science Department, Stony Brook University
Fall 2001	Ph.D. Dissertation Research (CSE-699), Computer Science Department, Stony Brook University
Spring 2001	Graduate Level *Operating Systems* (CSE-506), Computer Science Department, Stony Brook University
Spring 2001	*Advanced File Systems*, seminar, Computer Science Department, Stony Brook University
November 1999	Tutorial, *Using Amd and the Automounter Utilities*, USENIX LISA 13, Seattle, Washington
October 1999	*NFS: Protocols, Programming and Implementation* (guest lecture in Internet Systems Programming), Computer Science Department, Columbia University
1997–1999	*Operating System Vulnerabilities* (guest lecture in Network Security), Computer Science Department, Columbia University
Fall 1995	*Data Structures in C*, Computer Science Department, Columbia University
1986	*Programming in BASIC*, A.A. Computers, Holon, Israel
1986	*Programming in Logo*, A.A. Computers, Holon, Israel

Teaching Assistant

Spring 1995	*Computer Security*, Computer Science Department, Columbia University
Fall 1994	*Operating Systems*, Computer Science Department, Columbia University
Spring 1992	*Object-Oriented Programming and C++*, Computer Science Department, Columbia University

Spring 1989	*Data Structures*, Computer Science Department, Columbia University
Fall 1989	*Software Design Lab,* Computer Science Department, Columbia University
Fall 1988	*Introduction to Programming in Pascal*, Computer Science Department, Columbia University

GRADUATE STUDENTS (PH.D.)

Ph.D. Students Graduated

May 2014–Jan 2019	Zhen Cao Dissertation title: A Practical Auto-Tuning Framework for Storage Systems Current Position: Google, Inc. (Mountain View, CA)
May 2012–Apr 2017	Ming Chen. Dissertation title: Kurma: Efficient and Secure Multi-Cloud Storage Gateways for Network-Attached Storage Current Position: Google, Inc. (New York, NY)
Sep 2009–May 2014	Zhichao Li. Dissertation title: GreenDM: A Versatile Tiering Hybrid Drive for the Trade-Off Evaluation of Performance, Energy, and Endurance Current Position: VMware, Inc. (Palo Alto, CA)
Jan 2008–Nov 2013	Vasily Tarasov (IBM Ph.D. Fellow). Dissertation title: Multi-dimensional Workload Analysis and Synthesis for Modern Storage Systems Current Position: IBM Research–Almaden, Inc. (San Jose, CA)
Jan 2006–Dec 2013	Justin Seyster (domestic) Dissertation title: Runtime Verification of Kernel-Level Concurrency Using Compiler-Based Instrumentation Current Position: Apple Computer, Inc. (Cupertino, CA)
Jan 2008–Feb 2012	Richard Spillane (domestic). Dissertation title: Efficient, Scalable, and Versatile Application and System Transaction Management for Direct Storage Layers. Current Position: Apple Computer, Inc. (Cupertino, CA)
Sep 2007–May 2011	Vinay Pai (domestic). Dissertation title: Incentive Mechanisms for Peer-to-Peer Streaming. Current Position: MuCash (New York, NY)
Sep 2003–Aug 2009	Sean Callanan (domestic). Dissertation title: Flexible Debugging with Controllable Overhead. Current Position: Apple Computer, Inc. (Cupertino, CA)
Sep 2003–Aug 2008	Avishay Traeger (domestic) (IBM Ph.D. Fellow). Dissertation title: Analyzing Root Causes of Latency Distributions. Current Position: Research Staff Member, IBM Haifa Research Labs (Tel-Aviv, Israel)
Sep 2003–Feb 2008	Gopalan Sivathanu. Dissertation title: End-to-End Abstractions for Application-Aware Storage. Current position: Google, Inc. (Mountain View, CA).
May 2003–Dec 2006	Nikolai Joukov. Dissertation title: Versatile, Portable, and Efficient File System Profiling.

HULU EXHIBIT 1003
Page 65 of 73

	Current position: Research Staff Member, IBM T. J. Watson Research Center (Hawthorne, NY).
May 2003–May 2006	Charles P. Wright (domestic). Dissertation title: Extending ACID Semantics to the File System via `ptrace`. Current position: Research Staff Member, IBM T. J. Watson Research Center (Hawthorne, NY).

Current Ph.D. Students

Jan 2020–present	Yifei Liu
May 2019–present	Meyer "Alex" Merenstein
May 2018–present	Tyler Estro
Sep 2017–present	Ibrahim "Umit" Akgun

Past Ph.D. Students Advised

May 2019–Dec 2021	Wei Su
Nov 2014–Dec 2017	Sun (Jason) Zhen (visiting scholar from China)
Jun 2014–Dec 2016	Sonam Mandal
May 2004–Nov 2004	Anand Kashyap (He was Samir Das student. I advised him on one project and paper that came out of a class project.)
Sep 2001–May 2002	Li Aili (Student came to program interested in systems work, but became interested in graphics and switched areas altogether. Currently advised by Klaus Mueller.)
May 2001–May 2002	Joseph Spadavecchia (domestic) (I advised and funded student for one year. Student dropped out of program to go work and study in Scotland, for personal reasons. We co-authored one paper together.)
May 2002–Aug 2002	Zhenghong "Sam" Yang (Student already dropped from PhD to MS before I funded him under SPIR. Student graduated and now works for IBM.)
Sep 2001–May 2002	Hui Zhang (Student came to program interested in systems work, but became interested in hardware systems. Currently advised by Yuanyuan Yang.)

Graduate Students (M.S.)

Current M.S. Students

May 2022–present	Pradeep Nalluri
Jun 2021–present	Archit Saxena

Past M.S. Students

Jun 2021–May 2022	Manish Adkar
Jun 2021–May 2022	Nasratullah Sultany
Jun 2021–Jun 2022	Pei Liu

HULU EXHIBIT 1003
Page 66 of 73

Jun 2021–Dec 2021	Rohan Chhabra
Jun 2021–May 2022	Rishabh Srivastava
Jun 2021–May 2022	Shushanth Madhubalan
Jun 2021–May 2022	Tejeshwar Gurram
Jan 2021–Dec 2021	Aakarsh Duvvuru
Sep 2020–Dec 2021	Aadil Shaikh
Jun 2020–May 2021	Dheeraj Ramchandani
Jan 2020–Dec 2020	Abhiraj Smit
Jan 2020–May 2021	Gomathi Ganesan
Jan 2020–Dec 2020	Vigneshwaran Mylsamy
Jan 2020–Dec 2020	Yatna Verma
Aug 2019–May 2020	Aneesh Joshi
Jun 2019–Dec 2019	Sagar Jeevan
Jan 2019–Dec 2019	Akshay Aurora
Jan 2019–Dec 2019	Jatin Sood
Jan 2019–Dec 2019	Krapi Ravindra Shah
Jan 2019–Dec 2019	Mehul Jain
Jan 2019–Dec 2019	Pragesh Jagnani
Jan 2019–Dec 2019	Shobhit Khandelwal
Sep 2018–Dec 2019	Aayush Sureka
Sep 2018–May 2019	Dhivahar Perumal
Sep 2018–Dec 2019	Ritika Nevatia
May 2018–Dec 2019	Nilesh Somani
Jan 2018–Dec 2019	Prafful Agarwal
Jan 2018–Dec 2018	Ankit Aggarwal
Jan 2018–Dec 2018	Dhanashri Patil
Jan 2018–Dec 2018	Manu Mathew
Jan 2018–Dec 2018	Prateek Roy
Jan 2018–Dec 2018	Rahul Rane
Jan 2018–Dec 2018	Rohit Kumar
Jan 2018–Dec 2018	Saish Sali
Jan 2018–Dec 2018	Siddesh Shinde

Jan 2018–Dec 2018	Vineeth Ramesh
Aug 2017–Dec 2018	Noopur Anil Maheshwari
Sep 2017–Apr 2018	Tyler Estro
Jun 2017–May 2018	Mayur Jadhav
May 2017–May 2018	Maryia Maskaliova
Jan 2017–Dec 2017	Darshan Godhia
Jan 2017–Dec 2017	Farhaan Jalia
Jan 2017–Dec 2017	Geetika Babu Bangera
Jan 2017–Dec 2017	Kunal Shah
Jan 2017–Dec 2017	Nehil Shah
Jan 2017–Dec 2017	Nidhi Panpalia
Jan 2017–Dec 2017	Rushabh Shah
Jan 2017–Dec 2017	Sagar Shah
Jan 2017–Dec 2017	Swaminathan Sivaraman
Jan 2017–Dec 2017	Tushar Jain
Sep 2016–Dec 2017	Vinothkumar Raja
Aug 2016–Dec 2017	Arun Ramachandran
Aug 2016–Dec 2017	Mukul Sharma
Aug 2016–Dec 2017	Sachin Tiwari
Aug 2016–Dec 2017	Shivanshu Goswami
Aug 2016–Dec 2016	Vishal Sahu
Apr 2016–May 2017	Leixiang Wu
Jan 2016–Dec 2016	Praveen Kumar Morampudi
Jan 2016–Dec 2016	Vithiya Muthukumar
Jan 2016–Dec 2016	Harshkumar Patel
Jan 2016–Dec 2016	Deepika Peringanji
Jan 2016–Dec 2016	Venkatakrishnan Rajagopalan
Jan 2016–Dec 2016	Vishnu Vardhan Rajula
Jan 2016–Dec 2016	Hari Prasath Raman
Sep 2015–Dec 2016	Shubhi Rani
Jan 2016–Dec 2016	Jasmit Saluja
Sep 2015–Dec 2016	Ashok Sankar Harihara Subramony

Aug 2015–Dec 2016	Bharath Kumar Reddy Vangoor
Sep 2014–May 2016	Dongju Ok
Mar 2015–May 2016	Garima Gehlot
Sep 2015–Dec 2015	Vivek Tiwari
May 2014–Dec 2015	Kumar Sourav
Sep 2014–Dec 2015	Bharat Singh
Sep 2014–Dec 2015	Varun Shastry
May 2014–Dec 2015	Abhishek Gupta
Sep 2014–Dec 2015	Arvind Chaudhary
Sep 2014–Dec 2015	Aashray Arora
Sep 2013–May 2015	Arun Olappamanna Vasudevan
Jan 2014–May 2015	Akhilesh Chaganti
May 2014–May 2015	Udit Kaushik Chitalia
Apr 2014–May 2015	Kelong Wang
Sep 2013–Dec 2014	Soujanya Shankaranarayana
May 2014–Dec 2014	Li Mengyang
Sep 2013–May 2014	Amanpreet Mukker
Jun 2013–May 2014	Sonam Mandal
Sep 2012–Dec 2013	Deepak Jain
Sep 2012–Dec 2013	Sagar Trehan
Sep 2012–Dec 2013	Madhu Srikar Palmur
Sep 2012–May 2013	Benixon Arul Dhas
May 2012–Jun 2013	Karthikeyani Palanisami
Jan 2012–Dec 2012	Binesh Andrews
Jan 2012–Dec 2012	Atul Karmarkar
Sep 2011–Dec 2012	Mandar S. Joshi
Sep 2011–Dec 2012	Ravikant R. Malpani
Sep 2011–May 2012	Rajesh Aavuty
Jan 2011–May 2012	Amar Mudrankit
Jan 2011–Dec 2011	Siddhi Tadpatrikar
Sep 2010–Dec 2011	Samriti Katoch
Sep 2010–Dec 2011	Koundinya Santhosh Kumar

Aug 2010–May 2012	Pradeep Shetty
Jan 2011–May 2011	Koundinya Muppalla
Jan 2010–Dec 2010	Prabakar Radhakrishnan
Jan 2010–Dec 2010	Gyumin Sim
Sep 2009–Dec 2010	Shrikar Archak
Sep 2009–Dec 2010	Saumitra Bhanage
Sep 2009–Dec 2010	Sagar Dixit
Jan 2009–May 2010	Priya Sehgal
Jan 2009–Dec 2009	Karthikeyan Srinaivasan
Sep 2008–May 2010	Abhinav Duggal
Sep 2008–Dec 2009	Sujay Godbole
Jan 2008–Dec 2008	Yamini Allu
Jan 2008–Dec 2008	Manjunath Chinni
Jan 2008–Dec 2008	Sachin Gaikwad
Sep 2007–Jun 2009	Daniel J. Dean (domestic)
Sep 2007–Dec 2008	Himanshu Kanda
Sep 2007–May 2009	Rachita Kothiyal
Sep 2007–Dec 2008	Chaitanya Yalamanchili
Jan 2007–Dec 2007	Kimberly Albrecht (domestic, SFS scholar)
Jan 2007–Dec 2007	Ramya Edara
Jan 2007–Dec 2007	Ivan Deras Tabora
Jan 2007–Dec 2007	Kumar Thangavelu
Sep 2006–Dec 2007	Gopala Suryanarayana
Sep 2006–Dec 2007	Kiron Vijayasankar
Jun 2006–Dec 2007	Richard Spillane (domestic)
Jan 2006–August 2007	Swaminathan Sundararaman
Sep 2006–June 2007	Yiannis Pericleous
Sep 2005–May 2007	David Quigley (domestic, SFS scholar)
Jan 2006–March 2007	Harry Papaxenopoulos (domestic, SFS scholar)
Jan 2006–Dec 2006	Chaitanya Patti
Jan 2005–Dec 2005	Dan Ottavio (domestic)
Jan 2005–Dec 2005	Arun Kumar

Sep 2004–Dec 2005	Naveen Gupta
Sep 2004–Dec 2005	Rakesh Narayan Iyer
Sep 2004–Dec 2005	Sunil Satnur
May 2004–Nov 2004	Swapnil V. Patil
Jan 2004–Dec 2004	Mohammad Nayyer Zubair
Sep 2003–Aug 2005	Abhishek Rai
Sep 2003–Dec 2004	Aditya Kashyap
Sep 2003–Dec 2004	Devaki Pandurang Kulkarni
May 2003–Aug 2002	Akshat Khandelwal
May 2003–Aug 2002	Deepak Rao
May 2003–Aug 2004	Akshat Aranya
May 2003–Dec 2003	Alexander Butler (domestic)
May 2003–Dec 2003	Jay Pradip Dave
May 2003–Dec 2003	Mohan-Krishna Channa-Reddy
May 2003–Dec 2003	Salil Gokhale
May 2003–Jan 2004	Abhijith Das
May 2003–Dec 2004	Miretskiy “Eugene” Yevgeniy (domestic)
Jan 2003–Dec 2003	Harikesavan Pathangi Krishnan
Jan 2003–Dec 2003	Puja Gupta
May 2002–Dec 2002	Delia Paval
May 2002–Dec 2002	Nitin Khosla
May 2002–Dec 2002	Rongqing “Frank” Tu
May 2002–May 2003	Jeffrey R. Osborn (domestic)
May 2002–May 2003	Michael Martino (domestic)
May 2002–May 2003	Zhenghong “Sam” Yang
Sep 2002–Dec 2002	Nishant Nagalia
Sep 2002–Dec 2002	Zhou Zhang
Sep 2002–Dec 2003	Swaroop Karunakara
Sep 2002–May 2003	Ana Centeno
Sep 2002–May 2003	Andrew Himmer (domestic)
Sep 2002–May 2003	Sheshadri Sreenath
Mar 2002–Apr 2003	Manish Prasad

Jan 2002–May 2004	Kiran-Kumar Muniswamy-Reddy
Sep 2001–May 2003	Amit Purohit

UNDERGRADUATE STUDENTS

Jun 2021–present	Michael Arkhangelskiy
Jun 2021–present	Andrew Burford
Jun 2021–present	Michael McNeill

Past Undergraduate Students

Jun 2021–Jun 2022	Pei Liu (domestic, BS program, CSE program)
Jun 2020–Dec 2020	Haolin Yu (BS program, CSE program)
Jun 2020–May 2021	Haewon Julie Lee (BS program, CSE program)
Jun 2020–May 2021	Yang Yang (domestic, BS program, CSE program)
Aug 2019–May 2020	Yinuo Zhang (BS program, CSE program)
Jul 2019–Dec 2019	Abraham Spitalny, (domestic, BS program, CSE program)
May 2018–Dec 2018	Amrith Arunachalam (domestic, BS program, CSE program)
May 2017–May 2018	Kevin Sun (domestic, BS program, CSE program)
Feb 2015–Mar 2016	Leixiang Wu (domestic, BS program, CSE program)
July 2012–Dec 2012	Edgardo Linero, (domestic, BS program, CSE program)
May 2011–May 2012	Ryan Matthew Walsh, (domestic, BS program, ISE program)
May 2010–Aug 2011	Christopher Jutting, (domestic, BS program, ISE program)
Jan 2009–July 2009	Ryan Leif Walsh, (domestic, BS/MS program, Honors program)
Jan 2004–2009	Adam David Alan Martin (domestic)
Sep 2005–May 2008	Josef "Jeff" Sipek (domestic)
Jun 2006–August 2007	Daniel J. Dean (domestic)
Jan 2005–May 2006	Richard Spillane (domestic, BS/MS program, Honors program, Stony Brook URECA summer internship)
Jan 2005–Jul 2005	Tim Wong (domestic)
Jan 2005–Aug 2005	David Quigley (domestic)
May 2003–Dec 2003	Mohammad Nayyer Zubair (Honors program, Stony Brook URECA summer internship)
Jan 2002–May 2002	Evan Chan (domestic)
Jan 2002–May 2002	Reynold Mercado (domestic)
Jan 2002–May 2002	Jeffrey Osborn (domestic)
Jan 2002–May 2002	Julio Salazar (domestic)

Jan 2002–May 2002	Ariye Shater (domestic)
Jan 2002–May 2003	Charles P. Wright (Honors program advisor, domestic)
Jan 2002–May 2002	Yuri Yanpolski (domestic)

HIGH-SCHOOL STUDENTS

Past High-School Students

Sep 2015–Aug 2017	Henry Nelson (domestic), "NFSv4 Compounds (vNFS)" project
June 2005–August 2005	Jordan Hoch (domestic), Simons summer internship, project title "Visual Debugging of Operating Systems State.")

Stony Brook, New York, April 4, 2024

HULU EXHIBIT 1003
Page 73 of 73