

# Curriculum Vitae

Ethan L. Miller

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## EMPLOYMENT HISTORY

- 2000–        Computer Science Department, University of California, Santa Cruz  
              Professor (2008–)  
              Associate Professor (2002–2008)  
              Assistant Professor (2000–2002)
- 1999        System Architect, Endeca, Cambridge, MA
- 1994–2000   Assistant Professor, Computer Science and Electrical Engineering Department, University of Maryland  
              Baltimore County
- 1988–1994   Research Assistant, Computer Science Division, University of California at Berkeley
- 1988–1990   Teaching Associate, Computer Science Division, University of California at Berkeley
- 1987–1988   Software Engineer, BBN Laboratories, Cambridge, MA
- 1986        Summer intern, GTE Government Systems, Rockville, MD

## EDUCATION

- 1995        Ph. D., University of California at Berkeley, Computer Science (advisor: Randy Katz)  
              Thesis: *Storage Hierarchy Management for Scientific Computing*
- 1990        M. S., University of California at Berkeley, Computer Science
- 1987        Sc. B., Brown University, Computer Science, *magna cum laude*

## CONSULTING

- 2009–        Consultant, Pure Storage
- 2009–2010   Consulting expert, Sidley Austin LLP
- 2008–2009   Consulting expert, Sheppard Mullin Richter & Hampton LLP
- 2007        Hewlett Packard Laboratories
- 2006–2007   Consulting and testifying expert witness, Fish & Richardson
- 2005–2006   Veritas (now Symantec) Corporation
- 2003        Hewlett Packard Laboratories
- 2001–2005   Expert witness, Bartlit, Beck, Herman, Palenchar & Scott
- 2000        Expert witness, Fish & Richardson
- 1998–2001   Expert witness, Hopgood, Calimafde, Judlowe & Mondolino
- 1998        Web site architect, Ambleside Logic

## HONORS

- 2005        Best Long Paper award, StorageSS, 2005.
- 2004        Best Paper award, MASCOTS 2004.
- 2001        Elevated to Senior Member, IEEE.
- 1987        William Gaston Prize for Academic Excellence (award made to top graduating students at Brown University).
- 1987        Elected to Sigma Xi, Brown University.

## RESEARCH FUNDING

In addition to the grants listed below, I have helped bring in industrial funding for the Storage Systems Research Center, which, since 2002, has received \$100,000–\$200,000 per year from companies including Data Domain, Hewlett Packard, Hitachi, IBM, LSI, NetApp, Samsung, Seagate, and Symantec.

### Grants

- 2010–2013 co-PI, *Dynamic Non-Hierarchical File Systems for Exascale Storage*, Department of Energy (PI: Darrell Long), \$1,462,000.
- 2010–2013 co-PI, *LockBox: Enabling Users to Keep Data Safe*, National Science Foundation, \$496,000. (PI: Darrell Long).
- 2010 Gift from the Academy of Motion Picture Arts and Sciences in support of research on long-term archival storage, \$33,000.
- 2009–2014 PI, *Collaborative Research: A Multi-University I/UCRC Center on Intelligent Storage*, National Science Foundation, \$275,000 [UC Santa Cruz portion] (PI: David Du, University of Minnesota; co-PI: Darrell Long, UC Santa Cruz).
- 2009–2012 PI, *Scalable Data Management Using Metadata and Provenance*, National Science Foundation, \$553,000 (co-PI: Darrell Long; PI Margo Seltzer [Harvard] received an additional \$350,000 for a collaborative grant on this project).
- 2009–2012 PI, *Managing and Indexing Exascale Archival Storage Systems*, National Science Foundation, \$489,000.
- 2009–2010 Co-PI, *Trading Storage for Computation*, NASA Ames University-Affiliated Research Center (PI: Darrell Long), \$61,000.
- 2009–2010 Co-PI, *Development of a Collaborative Project for Remotely Sensed Science and Technology*, NASA Ames University-Affiliated Research Center (PI: Raphe Kudela, co-PIs: Darrell Long, Donald Potts, Eli Silver, Michael Loik, Chris Wilmers, Jeff Myers, Liane Guild, Francis Enomoto), \$100,000.
- 2007 co-PI, *ViewFS: Dynamic Name-Spaces for Metadata-Rich File Systems*, Lawrence Livermore National Laboratory, \$74,994 (PI: Darrell Long).
- 2006–2010 Co-PI, *Petascale Data Storage Institute*, \$9,000,000, Department of Energy (lead PI: Garth Gibson; UCSC PI: Darrell Long; other UC Santa Cruz co-PI is Scott Brandt). The Institute funds research at three universities and five national laboratories, with \$1,200,000 going to UC Santa Cruz.
- 2006–2009 Co-PI, *File System Tracing, Replaying, Profiling, and Analysis on HEC Systems*, National Science Foundation, \$760,252 (PI: Erez Zadok, Stony Brook University; co-PI: Klaus Mueller, Stony Brook University).
- 2006–2007 Co-PI, *Institute for Scalable Scientific Data Management*, Los Alamos National Laboratory, \$750,000 (PI: Darrell Long; co-PI: Scott Brandt; co-PI: Carlos Maltzahn).
- 2005–2006 PI, *Adaptive Workload-Aware Algorithms for Heterogeneous Storage Systems*, UC MICRO, \$80,269 (includes \$45,000 gift from Veritas).
- 2005–2006 Co-PI, *Scalable File Systems For High Performance Computing*, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Sandia National Laboratory, \$250,000 (PI: Scott Brandt; co-PI: Darrell Long; co-PI: Martín Abadi; co-PI: Carlos Maltzahn).
- 2005–2006 Co-PI, *Institute for Scalable Scientific Data Management*, Los Alamos National Laboratory, \$750,000 (PI: Darrell Long; co-PI: Scott Brandt).
- 2005 Co-PI, *Trustworthy Computing Curriculum Development*, Microsoft, \$50,000 (PI: Ira Pohl; co-PI: Martín Abadi; co-PI: Jim Whitehead).
- 2004 PI, *Research in Storage and Networks*, Hewlett-Packard Laboratories, \$25,000.
- 2003 PI, *Research in Storage and Networks*, Hewlett-Packard Laboratories, \$35,000.
- 2003–2006 PI, *Building High-performance, Reliable Storage Systems Using Magnetic RAM*, National Science Foundation, \$414,000 (co-PI: Scott Brandt).
- 2002–2005 Co-PI, *Scalable File Systems for High Performance Computing*, Department of Energy, \$900,000 (PI: Darrell Long; co-PI: Scott Brandt; co-PI: Katia Obraczka).
- 2002 PI, *Research in Storage and Networks*, Hewlett-Packard Laboratories, \$42,000.

- 2001–2002 Co-PI, *Building a High-Performance Storage System from Commodity Components*, Lawrence Livermore National Laboratory, \$65,000 (PI: Darrell Long; co-PI: Scott Brandt).
- 2001 PI, *Research in Storage and Networks*, Hewlett-Packard Laboratories, \$38,000.
- 1998–2001 Faculty Fellowship, University of Maryland Institute for Advanced Computer Studies, \$30,000.
- 1997–2001 Co-PI, *Center for Architectures for Data-Driven Information Processing*, Department of Defense, \$3,000,000 (PI: Charles Nicholas; co-PI: David Ebert).
- 1997–1998 PI, *Scalable Benchmarks for Mass Storage Systems*, NASA Ames Research Center, \$200,000.
- 1995–1997 Co-PI, *Scalability of the TELLTALE Dynamic Hypertext Environment*, Department of Defense, \$100,000 (PI: Charles Nicholas).
- 1995–1998 Faculty Fellowship, University of Maryland Institute for Advanced Computer Studies, \$30,000.
- 1989–1993 Graduate Fellowship, National Science Foundation.
- 1988–1989 Cal MICRO Fellowship, University of California at Berkeley.

## PUBLICATIONS

NOTE: (\*) denotes a student co-author, and (‡) denotes a student co-author who was one of my advisees.

### Journals

- J12. Mark W. Storer<sup>‡</sup>, Kevin M. Greenan<sup>‡</sup>, **Ethan L. Miller**, and Kaladhar Voruganti, “POTSHARDS—A Secure, Recoverable, Long-Term Archival Storage System”, *ACM Transactions on Storage* **5**(2), June 2009, pages 5:1–5:35.
- J11. Andrew W. Leung<sup>‡</sup>, Minglong Shao, Tim Bisson, Shankar Pasupathy, and **Ethan L. Miller**, “High-Performance Metadata Indexing and Search in Petascale Data Storage Systems”, *Journal of Physics: Conference Series* **125** (2008) 012069, July 2008.
- J10. Carlos Maltzahn, Nikhil Bobb\*, Mark W. Storer<sup>‡</sup>, Damian Eads<sup>‡</sup>, Scott A. Brandt, and **Ethan L. Miller**, “Graffiti: A Framework for Testing Collaborative Distributed Metadata”, *Distributed Data & Structures* **7**, *Proceedings in Informatics* **21**, Carleton Scientific, 2007, pages 97–111. Extended version of the WDAS 2006 workshop paper.
- J9. Bo Hong\*, Scott A. Brandt, Darrell D. E. Long, **Ethan L. Miller**, and Ying Lin\*, “Using MEMS-Based Storage in Computer Systems—MEMS Storage Device Modeling and Management”, *ACM Transactions on Storage* **2**(2), May 2006, pages 139–160.
- J8. Qin Xin<sup>‡</sup>, Thomas J. E. Schwarz, and **Ethan L. Miller**, “Availability in Global Peer-To-Peer Storage Systems”, *Distributed Data & Structures* **6**, *Proceedings in Informatics* **20**, Carleton Scientific, 2005, pages 63–77. Extended version of the WDAS 2004 workshop paper.
- J7. Ismail Ari<sup>‡</sup>, Ahmed Amer\*, Robert Gramacy\*, **Ethan L. Miller**, Scott A. Brandt, and Darrell D. E. Long, “ACME: Adaptive Caching Using Multiple Experts”, *Distributed Data & Structures* **5**, *Proceedings in Informatics* **14**, Carleton Scientific, 2002, pages 143–158. Extended version of the WDAS 2002 workshop paper.
- J6. **Ethan Miller**, Dan Shen<sup>‡</sup>, Junli Liu<sup>‡</sup>, and Charles Nicholas, “Performance and Scalability of a Large-Scale N-gram Based Information Retrieval System”, *Journal of Digital Information* **1**(5), January 2000, 25 pages (online refereed journal).
- J5. Christopher Shaw, James Kukla\*, Ian Soboroff\*, David Ebert, Charles Nicholas, Amen Zwa\*, **Ethan Miller**, and D. Aaron Roberts, “Interactive Volumetric Information Visualization for Document Corpus Management”, *International Journal on Digital Libraries* **2**(2–3), 1999, pages 144–156.
- J4. Jeffrey Hollingsworth, **Ethan Miller**, and Kennedy Akala<sup>‡</sup>, “Binary Version Management for Computational Grids”, *Parallel Processing Letters* **9**(2), June 1999, pages 215–225.

- J3. **Ethan Miller** and Randy Katz, “RAMA: An Easy-To-Use, High-Performance Parallel File System”, *Parallel Computing* **23**(4), July 1997, pages 419–446.
- J2. David Ebert, Amen Zwa\*, **Ethan Miller**, Chris D. Shaw, and D. Aaron Roberts, “Two-handed Volumetric Document Corpus Management”, *IEEE Computer Graphics and Applications* **17**(4), July 1997, pages 60–62.
- J1. Peter Chen, Edward Lee, Ann Drapeau, Ken Lutz, **Ethan Miller**, Srini Seshan, Ken Shirriff, David Patterson, and Randy Katz, “Performance and Design Evaluation of the RAID-II Storage Server”, *Journal of Distributed and Parallel Databases* **2**(3), July 1994, pages 243–260.

### Refereed Conference & Workshop Papers

- C95. Avani Wildani<sup>‡</sup>, **Ethan L. Miller**, “Semantic Data Placement for Power Management in Archival Storage”, *Proceedings of the 5<sup>th</sup> International Workshop on Petascale Data Storage (PDSW10)*, held in conjunction with SC2010, New Orleans, LA, November 2010.
- C94. Ian Adams<sup>‡</sup>, Mark W. Storer, and **Ethan L. Miller**, “Examining Energy Use in Heterogeneous Archival Storage Systems”, *Proceedings of the 18<sup>th</sup> IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2010)*, Miami, FL: IEEE, September 2010, pages 297–306.
- C93. Yangwook Kang<sup>‡</sup>, Jingpei Yang<sup>‡</sup>, and **Ethan L. Miller**, “Efficient Storage Management for Object-based Flash Memory”, *Proceedings of the 18<sup>th</sup> IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2010)*, Miami, FL: IEEE, September 2010, pages 407–409.
- C92. Aleatha Parker-Wood<sup>‡</sup>, Christina Strong\*, **Ethan L. Miller**, and Darrell D. E. Long, “Security Aware Partitioning for Efficient File System Search”, *Proceedings of the 26<sup>th</sup> IEEE Symposium on Mass Storage Systems and Technologies (MSST 2010)*, Incline Village, NV: IEEE, May 2010, 14 pages.
- C91. Ahmed Amer, Darrell D. E. Long, **Ethan L. Miller**, Jehan-François Pâris, and Thomas Schwarz, “Design Issues for a Shingled Write Disk System”, *Proceedings of the 26<sup>th</sup> IEEE Symposium on Mass Storage Systems and Technologies (MSST 2010)*, Incline Village, NV: IEEE, May 2010, 12 pages.
- C90. Yangwook Kang<sup>‡</sup> and **Ethan L. Miller**, “Adding Aggressive Error Correction to a High-Performance Flash File System”, *Proceedings of the 9<sup>th</sup> ACM & IEEE Conference on Embedded Software (EMSOFT ’09)*, Grenoble, France : ACM / IEEE, October 2009, pages 305–314.
- C89. Avani Wildani<sup>‡</sup>, Thomas J. E. Schwarz, **Ethan L. Miller**, and Darrell D. E. Long, “Protecting Against Rare Event Failures in Archival Systems”, *Proceedings of the 17<sup>th</sup> IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2009)*, London, UK: IEEE, September 2009, 11 pages. Preliminary version available as Technical Report UCSC-SSRC-09-03.
- C88. Kevin Greenan<sup>‡</sup>, Darrell D. E. Long, **Ethan L. Miller**, Thomas Schwarz, and Avani Wildani<sup>‡</sup>, “Building Flexible, Fault-Tolerant Flash-based Storage Systems”, *Proceedings of the 5<sup>th</sup> Workshop on Hot Topics in System Dependability (HotDep 2009)*, Estoril, Portugal, June 2009.
- C87. Ian F. Adams<sup>‡</sup>, Darrell D. E. Long, **Ethan L. Miller**, Shankar Pasupathy, and Mark W. Storer, “Maximizing Efficiency By Trading Storage for Computation”, *Proceedings of the Workshop on Hot Topics in Cloud Computing (HotCloud ’09)*, San Diego, CA: USENIX, June 2009, 5 pages.
- C86. Keren Jin<sup>‡</sup> and **Ethan L. Miller**, “The Effectiveness of Deduplication on Virtual Machine Disk Images”, *Proceedings of SYSTOR 2009: The Israeli Experimental Systems Conference*, Haifa, Israel, May 2009, 12 pages.
- C85. Andrew W. Leung<sup>‡</sup>, Minglong Shao, Tim Bisson, Shankar Pasupathy, and **Ethan L. Miller**, “Spyglass: Fast, Scalable Metadata Search for Large-Scale Storage Systems”, *Proceedings of the 7<sup>th</sup> Conference on File and Storage Technologies (FAST ’09)*, San Francisco, CA: USENIX, February 2009, pages 153–166.

- C84. Kevin M. Greenan<sup>‡</sup>, Darrell D. E. Long, **Ethan L. Miller**, Thomas J. Schwarz, S. J., and Jay J. Wylie, “A Spin-Up Saved is Energy Earned: Achieving Power-Efficient, Erasure-Coded Storage”, *Proceedings of the 4<sup>th</sup> Workshop on Hot Topics in System Dependability (HotDep’08)*, San Diego, CA: USENIX, December 2008.
- C83. Mark W. Storer<sup>‡</sup>, Kevin M. Greenan<sup>‡</sup>, Ian Adams<sup>‡</sup>, **Ethan L. Miller**, Darrell D. E. Long, and Kaladhar Voruganti, “Logan: Automatic Management for Evolvable, Large-Scale, Archival Storage”, *Proceedings of the 3<sup>rd</sup> International Workshop on Petascale Data Storage (PDSW08)*, held in conjunction with SC2008, Austin, TX, November 2008.
- C82. Andrew W. Leung<sup>‡</sup> and **Ethan L. Miller**, “Scalable Full-Text Search for Petascale File Systems”, *Proceedings of the 3<sup>rd</sup> International Workshop on Petascale Data Storage (PDSW08)*, held in conjunction with SC2008, Austin, TX, November 2008.
- C81. Mark W. Storer<sup>‡</sup>, Kevin Greenan<sup>‡</sup>, Darrell D. E. Long, and **Ethan L. Miller**, “Secure Data Deduplication”, *Proceedings of the 4<sup>th</sup> Workshop on Storage Security and Survivability (StorageSS 2008)*, held in conjunction with the 15<sup>th</sup> ACM Conference on Computer and Communications Security (CCS 2008), Alexandria, VA, October 2008.
- C80. Mohammed G. Khatib<sup>\*</sup>, **Ethan L. Miller** and Pieter H. Hartel, “Workload-Based Configuration of MEMS-Based Storage Devices for Mobile Systems”, *Proceedings of the 8<sup>th</sup> ACM & IEEE Conference on Embedded Software (EMSOFT ’08)*, Atlanta, GA: ACM / IEEE, October 2008.
- C79. Kevin M. Greenan<sup>‡</sup>, **Ethan L. Miller**, and Thomas Schwarz, “Optimizing Galois Field Arithmetic for Diverse Processor Architectures”, *Proceedings of the 16<sup>th</sup> IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2008)*, Baltimore, MD: IEEE, September 2008, 10 pages (CD-ROM).
- C78. Andrew W. Leung<sup>‡</sup>, Shankar Pasupathy, Garth Goodson, and **Ethan L. Miller**, “Measurement and Analysis of Large-Scale Enterprise Network File System Workloads”, *Proceedings of the 2008 USENIX Annual Technical Conference (USENIX ’08)*, Boston, MA: USENIX, June 2008, pages 213–226.
- C77. Kevin M. Greenan<sup>‡</sup>, **Ethan L. Miller**, and Jay J. Wylie, “Reliability of XOR-based erasure codes on heterogeneous devices”, *Proceedings of the 38<sup>th</sup> Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2008)*, Anchorage, AK: IEEE, June 2008, pages 147–156.
- C76. Neerja Bhatnagar<sup>‡</sup>, Kevin M. Greenan<sup>‡</sup>, Rosie Wacha<sup>\*</sup>, **Ethan L. Miller**, and Darrell D. E. Long, “Energy-Reliability Tradeoffs in Sensor Networks”, *Proceedings of the 5<sup>th</sup> Workshop on Embedded Networked Sensors (HotEmNets 2008)*, Charlottesville, VA: ACM, June 2008.
- C75. Mark W. Storer<sup>‡</sup>, Kevin M. Greenan<sup>‡</sup>, **Ethan L. Miller**, and Kaladhar Voruganti, “Pergamum: Replacing Tape with Energy Efficient, Reliable, Disk-Based Archival Storage”, *Proceedings of the 6<sup>th</sup> Conference on File and Storage Technologies (FAST ’08)*, San Jose, CA: USENIX, February 2008, pages 1–16.
- C74. Jonathan Koren<sup>\*</sup>, Yi Zhang, Sasha Ames<sup>‡</sup>, Andrew W. Leung<sup>‡</sup>, Carlos Maltzahn, and **Ethan Miller**, “Searching and Navigating Petabyte Scale File Systems Based on Facets”, *Proceedings of the 2<sup>nd</sup> International Workshop on Petascale Data Storage (PDSW07)*, held in conjunction with SC2007, Reno, NV, November 2007, pages 21–25.
- C73. Andrew Leung<sup>‡</sup>, **Ethan L. Miller**, and Stephanie Jones<sup>‡</sup>, “Scalable Security for Petascale Parallel File Systems”, *Proceedings of SC2007*, Reno, NV: ACM, November 2007.
- C72. Kevin M. Greenan<sup>‡</sup>, **Ethan L. Miller**, Thomas J. E. Schwarz, S. J., and Darrell D. E. Long, “Disaster Recovery Codes: Increasing Reliability with Large-Stripe Error Correction Codes”, *Proceedings of the 3<sup>rd</sup> International Workshop on Storage Security and Survivability (StorageSS 2007)*, held in conjunction with the 14<sup>th</sup> ACM Conference on Computer and Communications Security (CCS 2007), Alexandria, VA, October 2007.
- C71. Neerja Bhatnagar<sup>‡</sup> and **Ethan L. Miller**, “A Secure and Reliable File System for Sensor Nodes”, *Proceedings of the 3<sup>rd</sup> International Workshop on Storage Security and Survivability (StorageSS 2007)*, held in conjunction with the 14<sup>th</sup> ACM Conference on Computer and Communications Security (CCS 2007), Alexandria, VA, October 2007.

- C70. Kevin Greenan<sup>‡</sup> and **Ethan L. Miller**, “PRIMS: Making NVRAM Suitable for Extremely Reliable Storage”, *Proceedings of the 3<sup>rd</sup> Workshop on Hot Topics in System Dependability (HotDep ’07)*, Edinburgh, UK: USENIX, June 2007, 4 pages.
- C69. Mark W. Storer<sup>‡</sup>, Kevin Greenan<sup>‡</sup>, **Ethan L. Miller**, and Kaladhar Voruganti, “POTSHARDS: Secure Long-Term Storage Without Encryption”, *Proceedings of the 2007 USENIX Annual Technical Conference (USENIX ’07)*, Santa Clara, CA: USENIX, June 2007, pages 143–156.
- C68. Sage A. Weil\*, Scott A. Brandt, **Ethan L. Miller**, and Carlos Maltzahn, “CRUSH: Controlled, Scalable And Decentralized Placement Of Replicated Data”, *Proceedings of SC2006*, Tampa, FL: ACM, November 2006, 12 pages (published on CD-ROM).
- C67. Sage A. Weil\*, Scott A. Brandt, **Ethan L. Miller**, Darrell D. E. Long, and Carlos Maltzahn, “Ceph: A Scalable, High-Performance Distributed File System”, *Proceedings of the 7<sup>th</sup> Conference on Operating Systems Design and Implementation (OSDI ’06)*, Seattle, WA, November 2006, pages 307–320.
- C66. Mark W. Storer<sup>‡</sup>, Kevin M. Greenan<sup>‡</sup>, and **Ethan L. Miller**, “Long-Term Threats to Secure Archives”, *Proceedings of the 2<sup>nd</sup> International Workshop on Storage Security and Survivability (StorageSS 2006)*, held in conjunction with the 13<sup>th</sup> ACM Conference on Computer and Communications Security (CCS 2006), Virginia, October 2006, pages 9–16.
- C65. Andrew Leung<sup>‡</sup> and **Ethan L. Miller**, “Scalable Security for Large, High Performance Storage Systems”, *Proceedings of the 2<sup>nd</sup> International Workshop on Storage Security and Survivability (StorageSS 2006)*, held in conjunction with the 13<sup>th</sup> ACM Conference on Computer and Communications Security (CCS 2006), Virginia, October 2006, pages 29–40.
- C64. Kevin M. Greenan<sup>‡</sup> and **Ethan L. Miller**, “Reliability Mechanisms for File Systems Using Non-Volatile Memory as a Metadata Store”, *Proceedings of the 6<sup>th</sup> ACM & IEEE Conference on Embedded Software (EMSOFT ’06)*, Seoul, Korea, October 2006, pages 178–187.
- C63. Deepavali Bhagwat\*, Kristal Pollack\*, Darrell D. E. Long, **Ethan L. Miller**, Jehan-François Pâris, and Thomas Schwarz, S. J., “Providing High Reliability in a Minimum Redundancy Archival Storage System”, *Proceedings of the 14<sup>th</sup> IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2006)*, Monterey, CA, September 2006, pages 413–421.
- C62. Thomas J. E. Schwarz and **Ethan L. Miller**, “Store, Forget, and Check: Using Algebraic Signatures to Check Remotely Administered Storage”, *Proceedings of the 26<sup>th</sup> International Conference on Distributed Computing Systems (ICDCS ’06)*, Lisboa, Portugal, July 2006, 10 pages (published on CD-ROM).
- C61. Sasha Ames<sup>‡</sup>, Nikhil Bobb\*, Kevin M. Greenan<sup>‡</sup>, Owen S. Hofmann\*, Mark W. Storer<sup>‡</sup>, Carlos Maltzahn, **Ethan L. Miller**, and Scott A. Brandt, “LiFS: An Attribute-Rich File System for Storage Class Memories”, *Proceedings of the 23<sup>rd</sup> IEEE / 14<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2006)*, College Park, MD, May 2006, pages 63–76.
- C60. Nikhil Bobb\*, Damian Eads<sup>‡</sup>, Mark W. Storer<sup>‡</sup>, Scott A. Brandt, Carlos Maltzahn, and **Ethan L. Miller**, “Graffiti: A Framework for Testing Collaborative Distributed Metadata”, *7<sup>th</sup> Workshop on Distributed Data and Structures (WDAS 2006)*, Santa Clara, CA, January 2006.
- C59. Mark Storer<sup>‡</sup>, Kevin Greenan<sup>‡</sup>, **Ethan L. Miller**, and Carlos Maltzahn, “POTSHARDS: Storing Data for the Long-term Without Encryption”, *Proceedings of the 3<sup>rd</sup> International IEEE Security in Storage Workshop*, San Francisco, CA, December 2005.
- C58. Christopher Olson<sup>‡</sup> and **Ethan L. Miller**, “Secure Capabilities for a Petabyte-Scale Object-Based Distributed File System”, *Proceedings of the International Workshop on Storage Security and Survivability (StorageSS)*, held in conjunction with the 12<sup>th</sup> ACM Conference on Computer and Communications Security (CCS 2005), Fairfax, VA, November 2005, pages 64–73. Received Best Paper award.

- C57. Qin Xin<sup>‡</sup>, Thomas J. E. Schwarz, S. J., and **Ethan L. Miller**, “Disk Infant Mortality in Large Storage Systems”, *Proceedings of the 13<sup>th</sup> IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2005)*, Atlanta, GA, September 2005, pages 125–134.
- C56. Qin Xin<sup>‡</sup>, **Ethan L. Miller**, Thomas J. E. Schwarz, S. J., and Darrell D. E. Long, “Impact Of Failure On Interconnection Networks for Large Storage Systems”, *Proceedings of the 22<sup>nd</sup> IEEE / 13<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2005)*, Monterey, CA, April 2005, pages 189–196.
- C55. Alexander Ames<sup>‡</sup>, Nikhil Bobb<sup>\*</sup>, Scott A. Brandt, Adam Hiatt<sup>‡</sup>, Carlos Maltzahn, **Ethan L. Miller**, Alisa Neeman<sup>‡</sup>, and Deepa Tuteja<sup>\*</sup>, “Richer File System Metadata Using Links and Attributes”, *Proceedings of the 22<sup>nd</sup> IEEE / 13<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2005)*, Monterey, CA, April 2005, pages 49–60.
- C54. Sage A. Weil<sup>\*</sup>, Kristal T. Pollack<sup>\*</sup>, Scott A. Brandt, and **Ethan L. Miller**, “Dynamic Metadata Management for Petabyte-scale File Systems”, *Proceedings of SC2004*, Pittsburgh, PA: ACM, November 2004. Nominee, Best Student Paper.
- C53. Thomas J. E. Schwarz, S. J., Qin Xin<sup>‡</sup>, **Ethan L. Miller**, Darrell D. E. Long, Andy Hospodor, and Spencer Ng, “Disk Scrubbing in Large Archival Storage Systems”, *Proceedings of the 12<sup>th</sup> IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2004)*, Volendam, Netherlands, October 2004, pages 409–418. Received Best Paper award.
- C52. Nathan K. Edel<sup>‡</sup>, Deepa Tuteja<sup>\*</sup>, **Ethan L. Miller**, and Scott A. Brandt, “MRAMFS: A Compressing File System for Non-Volatile RAM”, *Proceedings of the 12<sup>th</sup> IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2004)*, Volendam, Netherlands, October 2004, pages 596–603.
- C51. Thomas J. E. Schwarz, Qin Xin<sup>‡</sup>, and **Ethan L. Miller**, “Availability in Global Peer-To-Peer Storage Systems”, *6<sup>th</sup> Workshop on Distributed Data and Structures (WDAS 2004)*, Lausanne, Switzerland, July 2004.
- C50. Nathan K. Edel<sup>‡</sup>, **Ethan L. Miller**, Karl S. Brandt<sup>\*</sup>, and Scott A. Brandt, “Measuring the Compressibility of Metadata and Small Files for Disk/NVRAM Hybrid Storage Systems”, *Proceedings of the 2004 International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS’04)*, San Jose, CA, July 2004.
- C49. Ismail Ari<sup>‡</sup> and **Ethan L. Miller**, “Caching Support for Push-Pull Data Dissemination using Data-snooping Routers”, *Proceedings of the 10<sup>th</sup> International Conference on Parallel and Distributed Systems (ICPADS)*, Newport Beach, CA: IEEE, July 2004, pages 101–108.
- C48. Qin Xin<sup>‡</sup>, **Ethan L. Miller**, and Thomas J. E. Schwarz, S. J. “Evaluation of Distributed Recovery in Large-Scale Storage Systems”, *Proceedings of the 13<sup>th</sup> IEEE International Symposium on High Performance Distributed Computing (HPDC-13)*, Honolulu, HI: IEEE, June 2004, pages 172–181.
- C47. Sage A. Weil<sup>\*</sup>, Scott A. Brandt, **Ethan L. Miller**, and Kristal T. Pollack<sup>\*</sup>, “Intelligent Metadata Management for a Petabyte-Scale File System”, 2<sup>nd</sup> Intelligent Storage Workshop, University of Minnesota, May 2004.
- C46. Emilia Rosti and **Ethan L. Miller**, “Security Threats and Responses for Object-Based Storage Devices”, 2<sup>nd</sup> Intelligent Storage Workshop, University of Minnesota, May 2004 (poster presentation).
- C45. R. J. Honicky<sup>‡</sup> and **Ethan L. Miller**, “Replication Under Scalable Hashing: A Family of Algorithms for Scalable Decentralized Data Distribution”, *Proceedings of the 18<sup>th</sup> International Parallel and Distributed Processing Symposium (IPDPS 2004)*, Santa Fe, NM: IEEE, April 2004, 10 pages (published on CD-ROM).
- C44. Feng Wang<sup>\*</sup>, Scott A. Brandt, **Ethan L. Miller**, and Darrell D. E. Long, “OBFS: A File System for Object-Based Storage Devices”, *Proceedings of the 21<sup>st</sup> IEEE / 12<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2004)*, College Park, MD, April 2004, pages 283–300.

- C43. Andy Hospodor and **Ethan L. Miller**, “Interconnection Architectures for Petabyte-Scale High-Performance Storage Systems”, *Proceedings of the 21<sup>st</sup> IEEE / 12<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2004)*, College Park, MD, April 2004, pages 273–281.
- C42. Feng Wang\*, Qin Xin<sup>‡</sup>, Bo Hong\*, Scott A. Brandt, **Ethan L. Miller**, Darrell D. E. Long, and Tyce T. McLarty, “File System Workload Analysis for Large Scale Scientific Computing Applications”, *Proceedings of the 21<sup>st</sup> IEEE / 12<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2004)*, College Park, MD, April 2004, pages 139–152.
- C41. Bo Hong\*, Scott A. Brandt, Darrell D. E. Long, **Ethan L. Miller**, Karen A. Glocer\*, and Zachary N. J. Peterson\*, “Zone-Based Shortest Positioning Time First Scheduling for MEMS-Based Storage Devices”, *Proceedings of the 11<sup>th</sup> IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2003)*, Orlando, FL, October 2003, pages 104–113.
- C40. Ismail Ari<sup>‡</sup>, Bo Hong\*, **Ethan L. Miller**, Scott A. Brandt and Darrell D. E. Long, “Managing Flash Crowds On The Internet”, *Proceedings of the 11<sup>th</sup> IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2003)*, Orlando, FL, October 2003, pages 246–249.
- C39. R. J. Honicky<sup>‡</sup> and **Ethan L. Miller**, “A Fast Algorithm for Online Placement and Reorganization of Replicated Data”, *Proceedings of the 17<sup>th</sup> International Parallel and Distributed Processing Symposium*, Nice, France: IEEE, April 2003, 10 pages (published on CD-ROM). Also available as Technical Report UCSC-CRL-02-36.
- C38. Qin Xin<sup>‡</sup>, **Ethan L. Miller**, Thomas Schwarz, Scott A. Brandt, Darrell D. E. Long, and Witold Litwin, “Reliability Mechanisms for Very Large Storage Systems”, *Proceedings of the 20<sup>th</sup> IEEE / 11<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2003)*, San Diego, CA: IEEE, April 2003, pages 146–156.
- C37. Scott A. Brandt, **Ethan L. Miller**, Darrell D. E. Long, and Lan Xue\*, “Efficient Metadata Management in Large Distributed File Systems”, *Proceedings of the 20<sup>th</sup> IEEE / 11<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2003)*, San Diego, CA: IEEE, April 2003, pages 290–298.
- C36. Ying Lin\*, Scott A. Brandt, Darrell D. E. Long, and **Ethan L. Miller**, “Power Conservation Strategies for MEMS-based Storage Devices”, *Proceedings of the 10<sup>th</sup> International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2002)*, Fort Worth, TX: IEEE, October 2002, pages 53–62.
- C35. Scott A. Banachowski\*, Zachary N. J. Peterson\*, **Ethan L. Miller**, and Scott A. Brandt, “Intra-file Security for a Distributed File System”, *Proceedings of the 19<sup>th</sup> IEEE Symposium on Mass Storage Systems and Technologies*, College Park, MD: IEEE, April 2002, pages 153–163.
- C34. Ismail Ari<sup>‡</sup>, Ahmed Amer\*, **Ethan Miller**, Scott Brandt, and Darrell Long. “Who is more adaptive? ACME: adaptive caching using multiple experts”, *Workshop on Distributed Data and Structures (WDAS 2002)*, Paris, France, March 2002.
- C33. **Ethan L. Miller**, Darrell D. E. Long, William E. Freeman<sup>‡</sup>, and Benjamin C. Reed\*, “Strong Security for Network-Attached Storage”, *Proceedings of the First Conference on File and Storage Technologies (FAST)*, Monterey, CA: Usenix, January 2002, pages 1–13.
- C32. **Ethan L. Miller**, Scott A. Brandt and Darrell D. E. Long, “HeRMES: High-Performance Reliable MRAM-Enabled Storage”, *Proceedings of the 8<sup>th</sup> IEEE Workshop on Hot Topics in Operating Systems (HotOS-VIII)*, Elmau, Germany: IEEE, May 2001, pages 83–87.
- C31. Lee Butler\*, Travis Atkison\*, and **Ethan Miller**, “Comparing CPU Performance Between and Within Processor Families”, *Proceedings of the 25<sup>th</sup> Annual International Conference on Computer Measurement and Performance (CMG 2000)*, Orlando, FL, December 2000, pages 421–430.

- C30. **Ethan Miller** and Jon Squire\*, “esim: A Structural Design Language and Simulator for Computer Architecture Education”, *2000 Workshop on Computer Architecture Education (WCAE 2000)*, Vancouver, Canada: ACM & IEEE, June 2000, pages 42–48.
- C29. William Freeman<sup>‡</sup> and **Ethan Miller**, “Design for A Decentralized Security System For Network Attached Storage”, *Proceedings of the 8<sup>th</sup> Goddard Conference on Mass Storage Systems and Technologies / 17<sup>th</sup> IEEE Symposium on Mass Storage Systems*, College Park, MD, March 2000, pages 361–373.
- C28. Timothy Gibson<sup>‡</sup> and **Ethan Miller**, “An Improved Long-Term File Usage Prediction Algorithm”, *Proceedings of the 25<sup>th</sup> Annual International Conference on Computer Measurement and Performance (CMG '99)*, Reno, NV: CMG, December 1999, pages 639–648.
- C27. William E. Freeman<sup>‡</sup> and **Ethan L. Miller**, “An Experimental Analysis of Cryptographic Overhead in Performance-Critical Systems”, *Proceedings of the 7<sup>th</sup> International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS '99)*, College Park, MD: IEEE, October 1999, pages 348–357.
- C26. **Ethan Miller**, Dan Shen<sup>‡</sup>, Junli Liu<sup>‡</sup>, Charles Nicholas, and Ting Chen<sup>‡</sup>, “Techniques for Gigabyte-Scale N-gram Based Information Retrieval on Personal Computers”, *Proceedings of the 1999 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA '99)*, Las Vegas, NV, June 1999, pages 1410–1416.
- C25. Michael Shapiro<sup>‡</sup> and **Ethan Miller**, “Managing Databases with Binary Large Objects”, *Proceedings of the 16<sup>th</sup> IEEE Mass Storage System Symposium*, San Diego, CA: IEEE, March 1999, pages 185–193.
- C24. Timothy Gibson<sup>‡</sup>, **Ethan L. Miller** and Darrell D. E. Long. “Long-term File Activity and Inter-reference Patterns”, *Proceedings of the 24<sup>th</sup> Annual International Conference on Computer Measurement and Performance (CMG '98)*, Anaheim, CA: CMG, December 1998, pages 976–987.
- C23. Kennedy Akala<sup>‡</sup>, **Ethan Miller**, and Jeff Hollingsworth, “Using Content-Derived Names for Package Management in Tcl”, *Proceedings of the 6<sup>th</sup> Annual Tcl/Tk Conference*, San Diego, CA: Usenix, September 1998, pages 171–179.
- C22. Theodore Johnson and **Ethan Miller**, “Performance Measurements of Tertiary Storage Devices”, *Proceedings of the 1998 Conference on Very Large Databases (VLDB '98)*, New York, NY: VLDB Foundation, August 1998, pages 50–61.
- C21. Jem Y. Fan, Xiangjun Zhao, J. P. Zhang, Fow-Sen Choa, Yanjie Chai, Jye-Hong Chen, **Ethan Miller**, Howard Motteler, Pao-Lo Liu, Tawee Tanbun-Ek, Patrick Wisk, Won-Tien Tsang, George J. Zydzik, and Charles A. Burrus, “Wavelength-division-multiplexed (WDM) data block switching for parallel computing and interconnect”, *SPIE International Conference on Applications of Photonic Technology*, Ottawa, Canada: SPIE, July 1998, vol. 3491, pages 634–638.
- C20. Steven Gribble\*, Gurmeet Singh Manku\*, Drew Roselli\*, Eric Brewer, Timothy Gibson<sup>‡</sup>, and **Ethan Miller**, “Self-Similarity in File Systems”, *Proceedings of the SIGMETRICS '98 / PERFORMANCE '98 Joint International Conference on Measurement and Modeling of Computer Systems*, Madison, WI: ACM, June 1998, pages 141–150.
- C19. Timothy J. Gibson<sup>‡</sup> and **Ethan Miller**, “Long-Term File Activity Patterns in a UNIX Workstation Environment”, *Proceedings of the 6<sup>th</sup> Goddard Conference on Mass Storage Systems and Technologies / 15<sup>th</sup> IEEE Symposium on Mass Storage Systems*, College Park, MD: IEEE, March 1998, pages 355–372.
- C18. Theodore Johnson and **Ethan Miller**, “Benchmarking Tape System Performance”, *Proceedings of the 6<sup>th</sup> Goddard Conference on Mass Storage Systems and Technologies / 15<sup>th</sup> IEEE Symposium on Mass Storage Systems*, College Park, MD: IEEE, March 1998, pages 95–112.
- C17. R. Scott Cost\*, Jeegar Lakhani\*, Ian Soboroff\*, Tim Finin, **Ethan Miller**, and Charles Nicholas, “TKQML: A Scripting Tool for Building Agents”, *Proceedings of the 1997 Conference on Agent Theories and Agent Languages (ATAL97)*, Newport, RI: AAI, July 1997, pages 339–343.

- C16. R. Scott Cost\*, Jeegar Lakhani\*, Ian Soboroff\*. Tim Finin, **Ethan Miller**, and Charles Nicholas, “Agent Development Support for Tcl”, *5<sup>th</sup> Annual Tcl/Tk Workshop '97*, Boston, MA: Usenix, July 1997, pages 177–178.
- C15. Jeff Hollingsworth and **Ethan Miller**, “Using Content-Derived Names for Configuration Management”, *Proceedings of the 1997 Symposium on Software Reusability (SSR '97)*, Boston, MA: IEEE, May 1997, pages 104–109.
- C14. David Ebert, Chris Shaw, Amen Zwa\*, **Ethan Miller**, and D. A. Roberts, “Interactive Volumetric Information Visualization for Document Corpus Management”, *Proceedings of Graphics Interface*, Kelowna, BC, Canada: Canadian Human-Computer Communications Society, May 1997, pages 121–128.
- C13. Timothy Gibson<sup>‡</sup> and **Ethan Miller**, “The Case for Personal Computers as Workstations”, *Proceedings of the 22<sup>nd</sup> Annual International Conference on Computer Measurement and Performance (CMG '96)*, San Diego, CA: CMG, December 1996, pages 644–652.
- C12. Amen Zwa<sup>‡</sup>, David Ebert, and **Ethan Miller**, “Multiresolution Document Analysis with Wavelets”, *Proceedings of the 1996 Conference on Information and Knowledge Management, Workshop on New Paradigms in Information Visualization and Manipulation*, Rockville, MD: ACM, December 1996, pages 50–53.
- C11. David Ebert, Chris Shaw, Amen Zwa<sup>‡</sup>, and **Ethan Miller**, “Minimally-immersive Interactive Volumetric Information Visualization”, *Proceedings of IEEE Information Visualization '96*, San Francisco, CA: IEEE, October 1996, pages 66–68.
- C10. **Ethan Miller**, “Towards Scalable Benchmarks for Mass Storage Systems”, *5<sup>th</sup> NASA Goddard Space Flight Center Conference on Mass Storage Systems and Technologies*, College Park, MD: IEEE & NASA, September 1996, pages 515–528.
- C9. **Ethan Miller** and Randy Katz, “RAMA: Easy Access to a High-Bandwidth Massively Parallel File System”, *Proceedings of the Winter 1995 USENIX Conference*, New Orleans, LA: Usenix, January 1995, pages 59–70.
- C8. Ann Drapeau, Peter Chen, John Hartman, Edward Lee, **Ethan Miller**, Ken Shirriff, Srinu Seshan, Randy Katz, Garth Gibson, and David Patterson, “RAID-II: A Scalable Storage Architecture for High-Bandwidth Network File Service”, *Proceedings of the 21<sup>st</sup> International Symposium on Computer Architecture*, Chicago, IL: ACM, April 1994, pages 234–244.
- C7. Peter Chen, Edward Lee, Ann Drapeau, Ken Lutz, **Ethan Miller**, Srinu Seshan, Ken Shirriff, David Patterson, and Randy Katz, “Performance and Design Evaluation of the RAID-II Storage Server”, *Proceedings of the International Parallel Processing Symposium Workshop on I/O in Parallel Computer Systems*, Newport Beach, CA: IEEE, April 1993, pages 110–120.
- C6. **Ethan Miller** and Randy Katz, “RAMA: A File System for Massively Parallel Computers”, *Digest of Papers, 12<sup>th</sup> IEEE Symposium on Mass Storage Systems*, Monterey, CA: IEEE, April 1993, pages 163–168.
- C5. Randy Katz, Peter Chen, Ann Drapeau, Edward Lee, **Ethan Miller**, Srinu Seshan, and David Patterson, “RAID-II: Design and Implementation of a Large Scale Disk Array Controller”, *Proceedings of the VLSI System Design Conference*, Seattle, WA: IEEE, March 1993.
- C4. **Ethan Miller** and Randy Katz, “An Analysis of File Migration in a UNIX Supercomputing Environment”, *Proceedings of the Winter 1993 USENIX Conference*, San Diego, CA: Usenix, January 1993, pages 421–433.
- C3. Randy H. Katz, David A. Patterson, Ann Chervenak-Drapeau, Joel Fine, and **Ethan Miller**, “An Approach to Cost-Effective Terabyte Memory Systems”, *Digest of Papers, Compcon Spring '92, 37<sup>th</sup> IEEE Computer Society International Conference*, San Francisco, CA: IEEE, February 1992, pages 395–400.
- C2. **Ethan Miller** and Randy Katz, “Input/Output Behavior of Supercomputing Applications”, *Proceedings of Supercomputing '91*, Albuquerque, NM: IEEE, November 1991, pages 567–576.
- C1. **Ethan Miller** and Randy Katz, “Analyzing the I/O Behavior of Supercomputing Applications”, *Digest of Papers, 11<sup>th</sup> IEEE Symposium on Mass Storage Systems*, Monterey, CA: IEEE, October 1991, pages 51–55.

## Chapters in Books

- CH1. Claudia Pearce and **Ethan Miller**, “The TELLTALE Dynamic Hypertext Environment: Approaches to Scalability”, in *Advances in Intelligent Hypertext*, J. Mayfield and C. Nicholas, eds. *Lecture Notes in Computer Science*, Springer-Verlag, October 1997, pages 109–130.

## Invited Articles

- I6. Andrew W. Leung<sup>‡</sup>, Minglong Shao, Tim Bisson, Shankar Pasupathy, and **Ethan L. Miller**, “Spyglass: Fast, Scalable Metadata Search for Large-Scale Storage Systems”, *login*: **34**(3), USENIX Association, June 2009.
- I5. Avishay Traeger, Erez Zadok, **Ethan L. Miller**, and Darrell D. E. Long, “Findings from the First Annual Storage and File Systems Benchmarking Workshop”, *login*: **33**(5), USENIX Association, October 2008, pages 113–117.
- I4. Mark W. Storer<sup>‡</sup>, Kevin M. Greenan<sup>‡</sup>, **Ethan L. Miller**, and Kaladhar Voruganti, “Pergamum: energy-efficient archival storage with disk instead of tape”, *login*: **33**(3), USENIX Association, June 2008, pages 15–21.
- I3. **Ethan L. Miller** and Darrell D. E. Long, “Including Experimental Methods in Operating Systems Courses”, ACM Workshop on Experimental Computer Science (ExpCS 2007), San Diego, CA, June 2007.
- I2. **Ethan L. Miller**, “Dealing with Long-Lived Data in High Performance Storage Systems”, *Storage on the Lunatic Fringe: Beyond Peta-Scale Storage Systems*, workshop at Supercomputing 2003, Phoenix, AZ, November 2003.
- I1. **Ethan Miller**, Darrell Long, William Freeman<sup>‡</sup>, and Benjamin Reed<sup>\*</sup>, “Strong Security for Distributed File Systems”, *Proceedings of the 20<sup>th</sup> IEEE International Performance, Computing, and Communications Conference (IPCCC 2001)*, Phoenix, AZ: IEEE, April 2001, pages 34–40.

## Work-in-Progress Posters and Presentations

- WP6. Aleatha Parker-Wood<sup>‡</sup>, Christina Strong<sup>\*</sup>, **Ethan L. Miller**, and Darrell D. E. Long, “Security Aware Partitioning for Efficient File Systems Search”, work-in-progress presentation and poster at the 8<sup>th</sup> Conference on File and Storage Technologies (FAST 2010), San Jose, CA, February 2010.
- WP5. Avani Wildani<sup>‡</sup> and **Ethan L. Miller**, “Probabilistic Reputation for Personal Trust Networks”, work-in-progress presentation and poster at the 7<sup>th</sup> Conference on File and Storage Technologies (FAST 2009), San Francisco, CA, February 2009.
- WP4. Sasha Ames<sup>‡</sup>, Carlos Maltzahn, and **Ethan L. Miller**, “A File System Query Language”, poster at the 21<sup>st</sup> Symposium on Operating Systems Principles (SOSP 2007), Stevenson, WA, October 2007.
- WP3. Mark W. Storer<sup>‡</sup>, Kevin Greenan<sup>‡</sup>, and **Ethan L. Miller**, “Secure Long-Term Archival Storage with POT-SHARDS”, work-in-progress presentation at the 5<sup>th</sup> Conference on File and Storage Technologies (FAST 2007), San Jose, CA, February 2007.
- WP2. Kevin Greenan<sup>‡</sup> and **Ethan L. Miller**, “CompulsiveFS: Making NVRAM Suitable for Extremely Reliable Storage”, work-in-progress presentation at the 5<sup>th</sup> Conference on File and Storage Technologies (FAST 2007), San Jose, CA, February 2007.
- WP1. Andrew Leung<sup>‡</sup> and **Ethan L. Miller**, “Scaling Security for Big, Parallel File Systems”, work-in-progress presentation at the 5<sup>th</sup> Conference on File and Storage Technologies (FAST 2007), San Jose, CA, February 2007.

## Technical Reports

- T15. Andrew W. Leung<sup>‡</sup>, Ian F. Adams<sup>‡</sup>, **Ethan L. Miller**, “Magellan: A Searchable Metadata Architecture for Large-Scale File Systems”, Technical Report UCSC-SSRC-09-07, November 2009.
- T14. Andrew W. Leung<sup>‡</sup>, Aleatha Parker-Wood<sup>‡</sup>, **Ethan L. Miller**, “Copernicus: A Scalable, High-Performance Semantic File System”, Technical Report UCSC-SSRC-09-06, October 2009.
- T13. Avani Wildani<sup>‡</sup>, Thomas J. E. Schwarz, **Ethan L. Miller**, Darrell D. E. Long, “Protecting Against Rare Event Failures in Archival Systems”, Technical Report UCSC-SSRC-09-03, April 2009.
- T12. Sasha Ames\*, Carlos Maltzahn, **Ethan L. Miller**, “Quasar: A Scalable Naming Language for Very Large File Collections”, Technical Report UCSC-SSRC-08-04, October 2008.
- T11. Sasha Ames\*, Carlos Maltzahn, **Ethan L. Miller**, “QUASAR: Interaction with File Systems Using a Query and Naming Language”, Technical Report UCSC-SSRC-08-03, September 2008.
- T10. Andrew W. Leung<sup>‡</sup>, Minglong Shao, Timothy Bisson, Shankar Pasupathy, **Ethan L. Miller**, “Spyglass: Fast, Scalable Metadata Search for Large-Scale Storage Systems”, Technical Report UCSC-SSRC-08-01, Storage Systems Research Center, University of California, Santa Cruz, May 2008.
- T9. Kevin M. Greenan<sup>‡</sup>, **Ethan L. Miller**, Thomas J. E. Schwarz, S. J., “Analysis and Construction of Galois Fields for Efficient Storage Reliability”, Technical Report UCSC-SSRC-07-09, Storage Systems Research Center, University of California, Santa Cruz, August 2007.
- T8. Mark W. Storer<sup>‡</sup>, Kevin Greenan<sup>‡</sup>, **Ethan L. Miller**, and Kaladhar Voruganti, “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, Technical Report UCSC-SSRC-06-03, Storage Systems Research Center, University of California, Santa Cruz, September 2006.
- T7. Sage A. Weil\*, Scott A. Brandt, **Ethan L. Miller**, and Carlos Maltzahn, “CRUSH: Controlled, Scalable And Decentralized Placement Of Replicated Data”, Technical Report SSRC-06-02, Storage Systems Research Center, University of California, Santa Cruz, March 2006.
- T6. Sage A. Weil\*, Feng Wang\*, Qin Xin<sup>‡</sup>, Scott A. Brandt, **Ethan L. Miller**, Darrell D. E. Long, and Carlos Maltzahn, “Ceph: a Scalable Object-Based Storage System”, Technical Report SSRC-06-01, Storage Systems Research Center, University of California, Santa Cruz, March 2006.
- T5. Geoff Kuenning and **Ethan L. Miller**, “Anonymization Techniques for URLs and Filenames”, Technical Report UCSC-CRL-03-05, Storage Systems Research Center, University of California, Santa Cruz, September 2003.
- T4. Nathan K. Edel<sup>‡</sup>, **Ethan L. Miller**, Karl S. Brandt\*, and Scott A. Brandt, “Measuring the Compressibility of Metadata and Small Files for Disk/NVRAM Hybrid Storage Systems”, Technical Report UCSC-CRL-03-04, Storage Systems Research Center, University of California, Santa Cruz, July 2003.
- T3. Timothy J. Gibson<sup>‡</sup> and **Ethan L. Miller**, “Long-Term File Activity in Diverse UNIX Environments”, Technical Report TR-CS-97-07, University of Maryland Baltimore County, October 1997.
- T2. R. Scott Cost\*, Ian Soboroff\*, Jeegar Lakhani\*, Tim Finin, **Ethan Miller**, and Charles Nicholas, “TKQML: A KQML Extension to Tcl”, Technical Report TR-CS-97-04, University of Maryland Baltimore County, July 1996.
- T1. **Ethan Miller** and Jeffrey Hollingsworth, “Using Content-Derived Names for Caching and Software Distribution”, Technical Report TR-CS-96-08, University of Maryland Baltimore County, July 1996. Also available as UMIACS Technical Report TR-96-55.

## Miscellanea

- M1. Randy Katz, John Ousterhout, David Patterson, Peter Chen, Ann Chervenak, Rich Drewes, Garth Gibson, Edward Lee, Ken Lutz, Ethan Miller, and Mendel Rosenblum, “A Project on High-Performance I/O Subsystems”, *Computer Architecture News* 17(5):24–31, September 1989.

## SOFTWARE

- SW1. GaloisField: A high-performance Galois field library written in C/C++ with an efficient Python interface. This software was co-authored with Kevin Greenan, one of my Ph. D. students.
- SW2. DLX0S: A CPU simulator and operating system used in undergraduate operating systems classes at the University of California, Santa Cruz, the University of Arizona, Purdue, the University of Maryland Baltimore County, and elsewhere.
- SW3. esim: A simple digital logic design language and simulator. Used for teaching computer architecture at the University of Maryland Baltimore County and elsewhere.

## PROFESSIONAL ACTIVITIES

### Service to Professional Societies

- 1996–           Member, Executive Committee, *IEEE Technical Committee on Mass Storage Systems*.
- 2001–2008     Chair, *IEEE Technical Committee on Operating Systems and Applications Environments*.
- 1995–2000     University Liaison for the Usenix Association.

### Editorial Duties

- 2009–           Associate Editor, *IEEE Transactions on Computers*.

### Conference Organization

- 2011     **Program Committee:** 27<sup>th</sup> IEEE Conference on Mass Storage Systems and Technologies (MSST 2011);  
The 4<sup>th</sup> Annual Israeli Experimental Systems Conference (SYSTOR 2011).
- 2010     **Program co-Chair:** The Israeli Experimental Systems Conference (SYSTOR 2010).  
**Program co-Chair:** First USENIX Workshop on Sustainable Information Technology (SustainIT '10).  
**Program Committee:** International Conference for High Performance Computing, Networking, Storage and Analysis (SC10);  
26<sup>th</sup> IEEE Conference on Mass Storage Systems and Technologies (MSST 2010);  
18<sup>th</sup> IEEE/ACM Conference on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2010);  
Workshop on Managing Systems via Log Analysis and Machine Learning Techniques (SLAML 2010);  
7<sup>th</sup> International Conference on Preservation of Digital Objects (iPRES 2010);  
**Steering Committee:** 26<sup>th</sup> IEEE Conference on Mass Storage Systems and Technologies (MSST 2010).
- 2009     **Program Committee:** 7<sup>th</sup> Conference on File and Storage Technologies (FAST 2009);  
17<sup>th</sup> IEEE/ACM Conference on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2009);  
The Israeli Experimental Systems Conference (SYSTOR 2009);  
1<sup>st</sup> Workshop on Hot Topics in Storage and File Systems (HotStorage '09);  
5<sup>th</sup> Workshop on Hot Topics in System Dependability (HotDep 2009).
- 2008     **Program co-Chair:** 16<sup>th</sup> IEEE/ACM Conference on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2008);  
**Program Committee:** 28<sup>th</sup> International Conference on Distributed Computing Systems (ICDCS 2008);  
4<sup>th</sup> ACM Workshop on Storage Survivability and Security (StorageSS 2008);  
5<sup>th</sup> IEEE International Workshop on Storage Network Architecture and Parallel I/O (SNAPI);  
1<sup>st</sup> International Workshop on Storage and I/O Virtualization, Performance, Energy, Evaluation and Dependability (SPEED 2008);  
3<sup>rd</sup> International Workshop on Software Support for Portable Storage (IWSSPS 2008).
- 2007     **Program Chair:** 24<sup>th</sup> IEEE Conference on Mass Storage Systems and Technologies (MSST 2007).  
**Area Vice-Chair:** 36<sup>th</sup> International Conference on Parallel Processing (ICPP 2007), Data-Intensive Computing track.

- Program Committee:** 3<sup>rd</sup> ACM Workshop on Storage Survivability and Security (StorageSS 2007);  
4<sup>th</sup> International IEEE Security in Storage Workshop (SISW 2007).
- 2006 **Program co-Chair:** 2<sup>nd</sup> ACM Workshop on Storage Survivability and Security (StorageSS 2006).  
**Program Committee:** 23<sup>rd</sup> IEEE / 14<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2006);  
14<sup>th</sup> IEEE/ACM Conference on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2006);  
7<sup>th</sup> Workshop on Distributed Data and Structures (WDAS 2006);  
2<sup>nd</sup> International Workshop on Software Support for Portable Storage (IWSSPS 2006).
- 2005 **Program Committee:** 13<sup>th</sup> IEEE/ACM Conference on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2005);  
22<sup>nd</sup> IEEE / 13<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2005);  
International Symposium on Emergence of Globally Distributed Data [also served as publications chair];  
International Workshop on Software Support for Portable Storage (IWSSPS 2005);  
1<sup>st</sup> ACM Workshop on Storage Survivability and Security (StorageSS);  
3<sup>rd</sup> International IEEE Security in Storage Workshop;  
**Invited Talks co-chair:** 2005 USENIX Technical Conference.
- 2004 **Program Committee:** 21<sup>st</sup> IEEE / 12<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2004);  
2<sup>nd</sup> Intelligent Storage Workshop;  
6<sup>th</sup> Workshop on Distributed Data and Systems (WDAS 2004);  
12<sup>th</sup> IEEE/ACM Conference on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2004), [also served as publications chair];  
Supercomputing (SC) 2004.
- 2003 **Program Committee:** 20<sup>th</sup> IEEE / 11<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies (MSST 2003) [also served as publications chair];  
2<sup>nd</sup> International IEEE Security in Storage Workshop.  
**Steering Committee:** HotOS-IX: Ninth Workshop on Hot Topics in Operating Systems.
- 2002 **Program Committee:** 1<sup>st</sup> File and Storage Technologies Conference (FAST 2002) [also served as publications chair];  
19<sup>th</sup> IEEE Mass Storage System Symposium /  
10<sup>th</sup> NASA Goddard Mass Storage and Technologies Conference;  
1<sup>st</sup> International IEEE Security in Storage Workshop;  
IEEE International Performance, Computing, and Communications Conference.
- 2001 **Program Committee:** 18<sup>th</sup> IEEE Mass Storage System Symposium / 9<sup>th</sup> NASA Goddard Mass Storage and Technologies Conference.
- 2000 **Program Committee:** 17<sup>th</sup> IEEE Mass Storage System Symposium / 8<sup>th</sup> NASA Goddard Mass Storage and Technologies Conference.
- 1999 **Program Committee:** 16<sup>th</sup> IEEE Mass Storage System Symposium / 7<sup>th</sup> NASA Goddard Mass Storage and Technologies Conference [also served as publications chair].
- 1998 **Program Committee:** 15<sup>th</sup> IEEE Mass Storage System Symposium / 6<sup>th</sup> NASA Goddard Mass Storage and Technologies Conference.
- 1996 **Program Committee:** Workshop on I/O in Parallel and Distributed Systems (IOPADS).

### Reviewer of Technical Papers and Proposals

- 2010 *IEEE Transactions on Dependable and Secure Computing; ACM Transactions on Storage; ACM Transactions on Information and System Security; IEEE Transactions on Knowledge and Data Engineering; 8<sup>th</sup> Conference on File and Storage Technologies (FAST); National Science Foundation (ad hoc review).*

- 2009 *IEEE Transactions on Knowledge and Data Engineering; Journal of Parallel and Distributed Computing; National Science Foundation (SBIR panel); National Science Foundation (CAREER panel); UC Discovery Grant.*
- 2008 *IEEE Transactions on Parallel and Distributed Systems; ETRI (Electronics and Telecommunications Research Institute) Journal; 6<sup>th</sup> Conference on File and Storage Technologies (FAST); British Computer Society Distinguished Dissertation Award; National Science Foundation (CISE panel).*
- 2007 *IEEE Transactions on Parallel and Distributed Systems; 5<sup>th</sup> Conference on File and Storage Technologies (FAST); Journal of Systems and Software; IBM Journal of Research and Development; IEEE Wireless Communications and Networking Conference; US-Israel Bi-national Science Foundation; National Science Foundation (CISE panel); National Science Foundation (CAREER panel); UC Discovery Grant.*
- 2006 *Conference on Dependable Systems and Networks (DSN); 7<sup>th</sup> Conference on Operating Systems Design and Implementation (OSDI); National Science Foundation (CAREER panel); National Science Foundation (SBIR panels).*
- 2005 *IEEE Transactions on Computers; 4<sup>th</sup> Conference on File and Storage Technologies (FAST); 19<sup>th</sup> International Symposium on Distributed Computing (DiSC 2005); National Science Foundation (CISE panel).*
- 2004 *3<sup>rd</sup> Conference on File and Storage Technologies (FAST); Conference on Dependable Systems and Networks (DSN); 6<sup>th</sup> Symposium on Operating Systems Design and Implementation (OSDI); Software—Practice and Experience; ACM Transactions on Computer Systems; National Science Foundation (CISE panel).*
- 2003 *IEEE Transactions on Parallel and Distributed Systems; Usenix Technical Conference; 2<sup>nd</sup> Conference on File and Storage Technologies; SC2003; National Science Foundation (SBIR panel).*
- 2002 *IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 5<sup>th</sup> Symposium on Operating Systems Design and Implementation (OSDI), Usenix Annual Technical Conference, National Science Foundation (SBIR panel).*
- 2001 *Usenix Annual Technical Conference; IEEE Transactions on Computers; National Science Foundation (ITR panel, SBIR panel).*
- 1990–2000 *National Science Foundation (panel reviewer); ACM Transactions on Computer Systems; IEEE Computer; International Symposium on Computer Architecture; Journal of Parallel and Distributed Computing; Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS); Symposium on Operating Systems Design and Implementation (OSDI); USENIX Annual Technical Conference.*

### Reviewer for Publishers

- 2009 Addison Wesley
- 2009 John Wiley & Sons
- 1997 Oxford University Press

### Membership in Professional Associations

- Senior Member, IEEE Computer Society.
- Member, Association for Computing Machinery.
- Member, Usenix Association.
- Member, Sigma Xi.

### Invited Talks

- 2010 “Storage Systems Research at UC Santa Cruz”, EMC / Data Domain.
- 2010 “Building Evolvable, Reliable, Energy-Efficient Secure Archival Storage”, University of Sydney, Sydney, Australia.

- 2010 “Pergamum: Evolvable, Reliable, Energy-Efficient Disk-Based Archival Storage”, XGen Congress: Applying NeXt GENERation Genomic Technologies for Now Generation Discoveries, San Diego, CA.
- 2010 “Fast, Scalable Metadata Search for Large-Scale Storage Systems”, Keio University, Shonan Fujisawa Campus, Tokyo, Japan.
- 2010 “The Role of IT and Education in Preparing Tomorrow’s Leaders” (talk and two panel discussions), Keio University, Shonan Fujisawa Campus, Tokyo, Japan.
- 2010 “Adding Aggressive Error Correction to a High-Performance Flash File System” and “Disk-Based Archiving and Deduplication”, Samsung, San Jose, CA.
- 2009 “Enabling New File System Designs with Non-Volatile Memory”, keynote talk at Symantec’s Cutting Edge event, Mountain View, CA.
- 2009 “Challenges in Building Long-Term Archival Storage from Smart Bricks”, Baskin School of Engineering Research Review Day, Santa Cruz, CA.
- 2009 “Managing Devices and Finding Data in Multi-Petabyte Media Archives”, *The Reel Thing XXII*, Association of Moving Image Archivists, Los Angeles, CA.
- 2009 “Scalable Data Management Using Metadata and Provenance”, HEC FSIO 2009 Conference, Arlington, VA.
- 2009 “Spyglass: Fast, Scalable Metadata Search for Large-Scale Storage Systems”, National University of Defense Technology, Changsha, China.
- 2009 “Challenges in Preserving Digital Data for the Long Term”, keynote talk, 4<sup>th</sup> IEEE International Conference on Networking, Architecture, and Storage (NAS 2009), Zhangjiajie, China.
- 2009 “Pergamum: Evolvable Energy Efficient, Reliable, Disk-Based Archival Storage”, University of Twente, Enschede, Netherlands.
- 2009 “Accurately Estimating Reliability of Heterogeneous Storage Systems”, Vrije University, Amsterdam, Netherlands.
- 2009 “The Effectiveness of Deduplication on Virtual Machine Disk Images”, IBM Thomas J. Watson Research Laboratory, Hawthorne, NY.
- 2008 “Pergamum: Energy Efficient, Reliable, Disk-Based Archival Storage”, CITRIS Research Exchange, University of California, Berkeley.
- 2008 “Building Reliable, Efficient Metadata Storage on NVRAM”, Hanyang University, Seoul, Korea.
- 2008 “Building Reliable, Efficient Metadata Storage on NVRAM”, Samsung, Seoul, Korea.
- 2008 “Reliable and Efficient Metadata Storage and Indexing Using NVRAM”, invited talk at the International Workshop on Large-Scale NVRAM Technology (NVRAMOS08) Workshop, Jeju, Korea.
- 2008 “Pergamum: Building Evolvable, Reliable, Searchable, Energy-Efficient Petascale Archival Storage from Disks”, Yahoo!, Santa Clara, CA.
- 2008 “Scaling Metadata and Indexing for Petabyte-Scale Storage”, invited talk at the 5<sup>th</sup> IEEE International Workshop on Storage Network Architecture and Parallel I/O, Baltimore, MD.
- 2008 Panel member, “SSD in the Enterprise”, Flash Memory Summit, Santa Clara, CA.
- 2008 “Highly Scalable Metadata Search and Indexing”, Metadata Research Panel, HEC FSIO 2008 Conference, Arlington, VA.
- 2008 “Search and indexing for petabyte-scale storage and beyond”, *Overcoming I/O Bottlenecks in Full Data Path Processing: Intelligent, Scalable Data Management from Data Ingest to Computation Enabling Access and Discovery*, National Science Foundation workshop, Arlington, VA.
- 2008 “Pergamum: Replacing Tape with Energy Efficient, Reliable, Disk-Based Archival Storage”, *The Reel Thing XX*, Association of Moving Image Archivists, Los Angeles, CA.
- 2008 “Pergamum: Evolvable Energy Efficient, Reliable, Disk-Based Archival Storage”, IBM off-site research review, San Jose, CA.
- 2008 “Pergamum: Replacing Tape with Energy Efficient, Reliable, Disk-Based Archival Storage”, LSI Logic, Boulder, CO.

- 2008 “Pergamum: Replacing Tape with Energy Efficient, Reliable, Disk-Based Archival Storage”, 8<sup>th</sup> Intelligent Storage Workshop, University of Minnesota, Minneapolis, MN.
- 2008 “Pergamum: Replacing Tape with Energy Efficient, Reliable, Disk-Based Archival Storage”, Symantec, Mountain View, CA.
- 2008 “Ceph: A Scalable, High-Performance Distributed File System”, University of Paderborn, Paderborn, Germany.
- 2008 “Pergamum: Replacing Tape with Energy Efficient, Reliable, Disk-Based Archival Storage”, University of Paderborn, Paderborn, Germany.
- 2008 “Scalable Security in Ceph”, Winter 2008 SNIA Security Summit, San Jose, CA.
- 2007 “Recent Research at the Storage Systems Research Center”, Data Domain, Sunnyvale, CA.
- 2007 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, University of California, Santa Barbara.
- 2007 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, TRUST seminar, University of California, Berkeley.
- 2007 “Disaster Tolerance Codes”, Agami, Sunnyvale, CA.
- 2007 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, VMware, Palo Alto, CA.
- 2007 “Reliability Mechanisms for File Systems Using Non-Volatile Memory as a Metadata Store”, Network Appliance, Sunnyvale, CA.
- 2007 “Ceph: A Scalable, High-Performance Distributed File System”, National Technology Alliance Data Retention and Processing Workshop, Herndon, VA.
- 2007 Visited the Data Storage Institute, affiliated with the National University of Singapore. Gave five talks at DSI and discussed DSI-UCSC collaborations with DSI researchers:
- “Ceph: A Scalable, High-Performance Distributed File System”
  - “Maat: Scalable Security for High Performance, Petascale Storage”
  - “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”
  - “Store, Forget, and Check: Using Algebraic Signatures to Check Remotely Administered Storage”
  - “Improving File System Performance and Reliability with Non-Volatile Memory”
- 2007 Panel member, Education Roundtable, Workshop on Experimental Computer Science (EXPCS 2007).
- 2007 Panel member, “High Performance I/O: The Road Less Traveled?” 8<sup>th</sup> LCI International Conference on High-Performance Clustered Computing.
- 2007 “Using Massive Arrays of Idle Disks (MAIDs) for Long-Term Storage in Digital Libraries”, Digital Library Forum, Pasadena, CA.
- 2007 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, University of New Mexico, Albuquerque, NM.
- 2007 “Ceph: Scalable, Reliable, Secure, High-Performance Storage”, Aster Data Systems, Redwood Shores, CA.
- 2007 “Improving File System Performance and Reliability with Non-Volatile Memory”, eBay, San Jose, CA.
- 2007 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, Winter 2007 SNIA Storage Security Workshop, San Diego, CA.
- 2007 “Ceph: Scalable, Reliable, Secure, High-Performance Storage”, University of New Mexico, Albuquerque, NM.
- 2007 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, IBM Almaden Research Lab, San Jose, CA.
- 2006 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, Data Domain, Santa Clara, CA.
- 2006 “Ceph: A Scalable, High-Performance Distributed File System”, University of Rhode Island, Kingston, RI.
- 2006 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, Brown University, Providence, RI.

- 2006 “Store, Forget, and Check: Using Algebraic Signatures to Check Remotely Administered Storage”, Symantec, Mountain View, CA.
- 2006 “Improving File System Usability, Performance and Reliability with Magnetic RAM”, Los Alamos National Laboratory, Los Alamos, NM.
- 2006 “Security in Large Scale File Systems”, Sandia National Laboratory, Albuquerque, NM.
- 2006 “Security in Large Scale File Systems”, National Security Agency, Fort Meade, MD.
- 2006 “POTSHARDS: Secure Long-Term Archival Storage Without Encryption”, IBM Storage Strategy Review (poster).
- 2006 “OSD Security”, Winter 2006 SNIA Storage Security Workshop, San Diego, CA.
- 2005 “Using Object Storage Devices to Provide Highly Reliable, Highly Scalable Storage”, keynote address at IBM Haifa Workshop on Systems and Storage.
- 2005 “Peta-scale Data Storage with Commodity Components”, Stony Brook University, Stony Brook, NY.
- 2005 “Peta-scale Data Storage with Commodity Components”, University of Maryland Baltimore County.
- 2005 “Object-Based Storage Systems”, Yahoo.
- 2005 “Ensuring Reliability for Petabyte-Scale Storage Systems”, Hewlett Packard Laboratories, Palo Alto, CA.
- 2004 “Is Massive Election Computer Fraud Possible?” panel discussion on *Voices*, Santa Cruz Community Television.
- 2004 “Dynamic Metadata Management for Large Distributed Storage Clusters”, Sandia National Laboratory, Albuquerque, NM.
- 2003 Panel member, “Roadmaps, Research Thrusts, and More Visibility For Storage Issues”, *Storage on the Lunatic Fringe: Beyond Peta-Scale Storage Systems*, Supercomputing 2003 workshop.
- 2003 “Storage Research in the UCSC Storage Systems Research Center”, Veritas Corporation, Mountain View, CA.
- 2003 “RUSH: A Family of Algorithms for the Placement of Objects in Distributed Object Storage Devices”, Hewlett Packard Laboratories, Palo Alto, CA.
- 2003 Panel member, “Emerging Object/Active-Storage Technologies”, 20<sup>th</sup> IEEE / 11<sup>th</sup> NASA Goddard Conference on Mass Storage Systems and Technologies.
- 2001 “Improving File System Performance Using Magnetic RAM (MRAM)”, Hewlett Packard Laboratories.
- 2001 “Strong Security for Network-Attached Storage”, IBM Research.
- 2000 “RAMA: A Reliable High-Performance Scalable File System”, Army Research Lab.
- 2000 “RAMA: A Reliable High-Performance Scalable File System”, University of California, Santa Cruz.
- 1999 “Building Large Scalable File Systems”, Lawrence Livermore National Laboratory.
- 1999 “Scaling TELLTALE from Megabytes to Gigabytes”, Department of Defense.
- 1998 “Content-Derived Names: Security, Distribution, and Version Management”, University of Wisconsin, Milwaukee.
- 1997 “Performance Evaluation and Estimation”, RWD, Inc. (Columbia, MD).
- 1997 “Challenges in Mass Storage”, Silicon Graphics.
- 1996 “RAMA: An Easy-to-Use, Scalable High Performance Parallel File System”, Sandia National Laboratory.

## UNIVERSITY SERVICE

### Departmental and School Service

- 2010–11 Computer Science Department Strategic Directions Committee.
- 2009–10 Chair, School of Engineering Computing Infrastructure Committee; Computer Science Dept. Personnel Committee; Computer Science Dept. Computing Committee.

- 2008–09 Chair, School of Engineering Computing Infrastructure Committee; Computer Science Dept. Personnel Committee; Computer Science Dept. Computing Committee; Computer Science Dept. Seminar Committee.
- 2007–08 Chair, School of Engineering Computing Infrastructure Committee; Computer Science Dept. Personnel Committee; Computer Science Dept. Computing Committee.
- 2006–07 School of Engineering Computing Infrastructure Committee (member, Fall; chair, Spring); Computer Science Dept. Personnel Committee; Computer Science Dept. Computing Committee.
- 2005–06 School of Engineering Computing Infrastructure Committee (chair, Fall; member Winter and Spring); Computer Science Dept. Personnel Committee; Computer Science Dept. Computing Committee.
- 2004–05 Chair, School of Engineering Computing Infrastructure Committee; Computer Science Dept. Faculty Recruiting Committee; Computer Science Dept. Personnel Committee (chaired 2 reviews); Computer Science Dept. Computing Committee.
- 2003–04 Chair, School of Engineering Computing Infrastructure Committee; Chair, Computer Science Dept. Computing Committee; Computer Science Dept. Faculty Recruiting Committee.
- 2002–03 Chair, School of Engineering Computing Infrastructure Committee.
- 2001–02 School of Engineering Computing Infrastructure Committee; Computer Science Dept. Faculty Recruiting Committee.
- 2000–01 Computer Science Dept. Faculty Recruiting Committee.

### College Committees

- 2010–11 Crown College Executive Committee

### University Committees

- 2007–08 Committee on Faculty Research Lecture
- 2006–07 Committee on Computing and Telecommunications (Fall & Spring)
- 2005–06 Chair, Committee on Computing and Telecommunications.
- 2004–05 Chair, Committee on Computing and Telecommunications.
- 2003–04 Committee on Computing and Telecommunications (Winter & Spring).
- 2003 Information Technology Vision Committee.

### System-Wide Committees

- 2005–06 Committee on Information Technology and Telecommunications Policy.
- 2004–05 Committee on Information Technology and Telecommunications Policy.

### COMMUNITY SERVICE

- 2003–05 Member, Santa Cruz Hillel Board of Directors
- 2002– Alumni interviewer, Brown University

### ADVISING

#### Advisor to Continuing Graduate Students

- |                  |        |
|------------------|--------|
| Ian Adams        | Ph. D. |
| Yangwook Kang    | Ph. D. |
| Daniel Rosenthal | Ph. D. |
| Avani Wildani    | Ph. D. |
| Jingpei Yang     | Ph. D. |

**Doctoral Advisor**

2009	Andrew Leung	<i>Organizing, Indexing, and Searching Large-Scale File Systems</i>
2009	Kevin Greenan	<i>Reliability and Efficiency in Erasure-Coded Storage Systems</i>
2009	Mark Storer	<i>Secure, Energy-Efficient, Evolvable, Long-Term Archival Storage</i>
2005	Qin Xin	<i>Understanding and Coping with Failures in Large-Scale Storage Systems</i>
2004	Ismail Ari	<i>Design and Management of Globally-Distributed Network Caches</i>
2002	Naomi Avigdor	<i>Building a Scalable and Reliable Parallel File System Using Commodity Computers</i>
2000	William Freeman	<i>Decentralized Security for Network-Attached Storage</i>
1998	Timothy Gibson	<i>Long-term UNIX File System Activity and the Efficacy of Automatic File Migration</i>

**Doctoral Dissertation Reading Committee Member**

2010	Deepavali Bhagwat	<i>Prof. Darrell Long</i>
2009	Mohammed Khatib	<i>Prof. Pieter Hartel (University of Twente, Netherlands)</i>
2008	David Pease	<i>Profs. Richard Hughey and Darrell Long</i>
2008	Vinay Pai	<i>Prof. Erez Zadok (Stony Brook University)</i>
2008	Guozheng Ge	<i>Prof. E. James Whitehead</i>
2007	Sage Weil	<i>Prof. Scott Brandt</i>
2006	Nikolai Joukov	<i>Prof. Erez Zadok (Stony Brook University)</i>
2006	Lawrence You	<i>Prof. Darrell Long</i>
2006	Feng Wang	<i>Prof. Scott Brandt</i>
2005	Bo Hong	<i>Profs. Darrell Long and Scott Brandt</i>
2005	Scott Banachowski	<i>Prof. Scott Brandt</i>
2002	Ahmed Amer	<i>Prof. Darrell Long</i>
2002	Tsozen (Frank) Yeh	<i>Prof. Darrell Long</i>
2000	Ian Soboroff	<i>Prof. Charles Nicholas (UMBC)</i>

**Doctoral Qualifying Exam Committee Member**

2010	Lanbo Zhang	<i>Prof. Yi Zhang</i>
2008	Andrew Leung	<i>Prof. Ethan Miller</i>
2008	Dhananjay Sampath	<i>Prof. J. J. Garcia-Luna</i>
2008	Kevin Greenan	<i>Prof. Ethan Miller</i>
2008	Neerja Bhatnagar	<i>Prof. Ethan Miller</i>
2007	Mark W. Storer	<i>Prof. Ethan Miller</i>
2007	Deepavali Bhagwat*	<i>Prof. Darrell Long</i>
2006	Sage Weil*	<i>Prof. Scott Brandt</i>
2006	Elias Sinderson	<i>Prof. E. James Whitehead</i>
2006	Nikolai Joukov	<i>Prof. Erez Zadok (Stony Brook University)</i>
2005	David Pease	<i>Prof. Darrell Long</i>
2004	Guozheng Ge*	<i>Prof. E. James Whitehead</i>
2004	Damian Cieslicki	<i>Prof. Thomas Schwarz (Santa Clara University)</i>
2003	Scott Banachowski	<i>Prof. Scott Brandt</i>
2003	Qin Xin	<i>Prof. Ethan Miller</i>
2003	Bo Hong	<i>Prof. Darrell Long</i>
2003	Feng Wang	<i>Prof. Scott Brandt</i>
2002	Ismail Ari	<i>Prof. Ethan Miller</i>
2001	Tsozen Yeh	<i>Prof. Darrell Long</i>
1999	Naomi Avigdor	<i>Prof. Ethan Miller (UMBC)</i>
1999	William Freeman	<i>Prof. Ethan Miller (UMBC)</i>
1998	Ian Soboroff	<i>Charles Nicholas (UMBC)</i>
1997	Timothy Gibson	<i>Prof. Ethan Miller (UMBC)</i>
1995	Vincent Marier	<i>Prof. Deepinder Sidhu (UMBC)</i>

Note: \* indicates that I served as qualifying exam committee chair.

**Masters of Science Advisor**

2010	Keren Jin	<i>Deduplication on Virtual Machine Disk Images</i>
2010	Aleatha Parker-Wood	<i>Security Aware Partitioning for Efficient File System Search</i>
2010	Ian Adams	non-thesis
2009	Mrunal Gawade	non-thesis
2008	Casey Marshall	non-thesis
2008	Danni Fu	non-thesis
2007	Jeff Hagen	<i>Ladon: A Framework for Peer-to-Peer Backup</i>
2007	Max Mehech	non-thesis
2007	Andrew Leung	<i>Security in Scalable Storage Systems</i>
2006	Kevin Greenan	non-thesis
2006	Mark Storer	non-thesis
2005	Christopher Olson	non-thesis
2005	Chengyu Sung	<i>Integrating Pictorial Identity into Secure Email</i>
2005	Sasha Ames	non-thesis
2004	R. J. Honicky	<i>Object Placement Algorithms for OBSD Systems</i>
2001	Kennedy Akala	non-thesis
2000	Vivekand Krishnamoorthi	<i>A Comparison of Long Term File Migration Algorithms</i>
1999	Ting Chen	non-thesis
1998	Junli Liu	non-thesis
1998	Michael Shapiro	non-thesis
1998	Dan Shen	<i>Experiments with Large-Scale N-gram Based Information Retrieval</i>
1998	Changgong Zhang	non-thesis
1997	Eric Robertson	non-thesis
1996	Arun C. Mahendran	non-thesis
1996	Amen Zwa	non-thesis

**Masters of Science Reading Committee Member**

2010	Stephanie Jones	<i>Prof. Darrell Long</i>
2008	Rosie Wacha	<i>Prof. Darrell Long</i>
2007	Corrie Scalisi	<i>Prof. Manfred Warmuth</i>
2006	Suma Potluri	<i>Prof. E. James Whitehead</i>
2006	Nikhil Bobb	<i>Prof. Scott Brandt</i>
2005	Travis Odegaard	<i>Prof. Scott Brandt</i>
2004	Svetlana Kagan	<i>Prof. Darrell Long</i>
2004	Deepa Tuteja (thesis)	<i>Prof. Scott Brandt</i>
2003	Suruchi Malapture (thesis)	<i>Prof. Scott Brandt</i>
2003	Karen Glocer	<i>Prof. Darrell Long</i>
2003	Ravindra Vaishampayan	<i>Prof. J. J. Garcia-Luna</i>
2003	Caixue Lin	<i>Prof. Scott Brandt</i>
1999	Amy Germida	<i>Prof. James Plusquellic (UMBC)</i>
1996	Greg Sylvain	<i>Prof. Tim Finin (UMBC)</i>
1996	Chetan Shah	<i>Prof. Charles Nicholas (UMBC)</i>
1996	Scott Stewart	<i>Prof. Tim Finin (UMBC)</i>

## COURSES TAUGHT

Note that classes from Fall 1994 through Spring 2000 are semester classes, and classes from Fall 2000 onward are quarter classes. Courses in bold italics are those for which I either developed or significantly revised the curriculum.

### Undergraduate

Spring 2010 Computer Security  
Spring 2009 Operating Systems  
Fall 2008 ***Introduction to Programming in Python***  
Spring 2008 Distributed Systems  
Fall 2007 Operating Systems  
Spring 2007 Computer Security  
Spring 2006 Operating Systems  
Winter 2006 ***Distributed Systems***  
Winter 2005 Computer Security  
Fall 2004 Operating Systems  
Spring 2004 Computer Security  
Fall 2003 Operating Systems  
Spring 2003 ***Computer Security***  
Winter 2003 Operating Systems  
Winter 2002 Introduction to Data Structures  
Fall 2001 Operating Systems  
Fall 2000 Operating Systems  
Fall 1999 Operating Systems  
Spring 1999 Operating Systems  
Fall 1997 Computer Architecture  
Spring 1997 Computer Architecture  
Spring 1996 Computer Architecture  
Spring 1995 ***Computer Architecture***  
Fall 1994 Computer Architecture

### Graduate

Winter 2010 Distributed Systems  
Winter 2009 Operating Systems  
Winter 2008 Storage Systems  
Spring 2007 Distributed Systems  
Fall 2005 Operating Systems  
Spring 2005 Distributed Systems  
Winter 2004 Storage Systems  
Fall 2002 Operating Systems  
Spring 2002 ***Distributed Systems***  
Spring 2001 Computer Security  
Spring 2000 Computer Architecture  
Spring 2000 Storage Systems  
Fall 1998 Computer Architecture  
Spring 1998 Storage Systems  
Fall 1997 Computer Architecture  
Spring 1997 Operating Systems

Fall 1996    Computer Architecture

Fall 1995    Computer Architecture