1 Matthew L. Curry, Ph.D.

Matthew L. Curry is a Senior Member of Technical Staff at Sandia National Laboratories. His primary areas of research include extreme-scale file and storage systems, application of erasure coding algorithms and other data safety algorithms to storage, heterogeneous computing, and characteristics of low-level storage devices. He has given invited lectures at EMC, the University of Alabama at Birmingham, and Auburn University.

1.1 Program Committees

- The 7th Parallel Data Storage Workshop, held in conjunction with Supercomputing 2012.

- The 28th IEEE Conference on Massive Data Storage (MSST 2012)

- The 4th International Workshop on Frontiers of Heterogeneous Computing (FHC 2013)

1.2 Reviewing Activities

He performs several reviews a year for the following journals:

- ACM Transactions on Storage

- ACM Transactions on Parallel Computing

- Concurrency and Computation, Practice and Experience

1.3 Education and Training

- Ph.D., Computer and Information Sciences
  University of Alabama at Birmingham, December 2010

- M.S., Computer and Information Sciences
  University of Alabama at Birmingham, May 2008

- B.S., Computer and Information Sciences
  University of Alabama at Birmingham, December 2004

1.4 Research and Professional Experience

- **Senior Member of Technical Staff, Scalable System Software, Sandia National Laboratories**, 2010-Present.
  Performing research and development activities associated with high-performance storage and operating systems for massively parallel computing systems.

- **Systems Analyst, Department of Computer and Information Sciences, University of Alabama at Birmingham**, January 2009 - May 2009.
  Supported research software development activities for NSF Award CNS-0821497, "MRI: Development of a GPU-Enabled Integrated Storage Computation Architecture and System."

- **Student Intern, Sandia National Laboratories**, Summers 2005-2008 and May 2009-December 2010.
  Performed research and development activities associated with high-performance storage and operating systems for massively parallel computing systems.

- **Teaching and Research Assistant, Department of Computer and Information Sciences, University of Alabama at Birmingham**, during spring and fall semesters beginning January 2005 and ending May 2009.
  Performed research, taught courses (Operating Systems, Introduction to C++), gave guest lectures (Parallel Computing, Software Engineering), graded, and conducted labs.

1.5 Publications

1. *Gibraltar: A Reed-Solomon Coding Library for Storage Applications on Programmable Graphics Processors.* Matthew L. Curry, Anthony Skjellum, H. Lee Ward, Ron Brightwell (2011). Concurrency and Computation, Practice and Experience, Volume 23, Issue 18 (pages 2477-2495).

2. *GPUstore: Harnessing GPU Computing for Storage Systems in the OS Kernel.* Weibin Sun, Robert Ricci, Matthew L Curry. The 5th Annual International Systems and Storage Conference (SYSTOR 2012).

3. *A Lightweight, GPU-Based Software RAID System.* Matthew L. Curry, H. Lee Ward, Anthony Skjellum, Ron Brightwell. International Conference on Parallel Processing (ICPP) 2010.

4. *Accelerating Reed-Solomon coding in RAID systems with GPUs.* Matthew L. Curry, Anthony Skjellum, H. Lee Ward, Ron Brightwell. IEEE International Parallel and Distributed Processing Symposium (IPDPS) 2008.

5. *Power Use of Disk Subsystems in Supercomputers.* Matthew L. Curry, H. Lee Ward, Gary Grider, Jill Gemmill, Jay Harris, David Martinez (2011). Proceedings, 6th Parallel Data Storage Workshop, Seattle, Washington.

6. *Failing in Place for Low-Serviceability Infrastructure Using High-Parity GPU-Based RAID.* Matthew L. Curry, H. Lee Ward, Anthony Skjellum, High Performance Embedded Computing Workshop (HPEC) 2010.

7. *Using GPUs to Enable Highly Reliable Embedded Storage.* Matthew L. Curry, Anthony Skjellum, Lee Ward, Ron Brightwell. HPEC 2008. September 24, 2008.

8. *Arbitrary Dimension Reed-Solomon Coding and Decoding for Extended RAID on GPUs.* Matthew L. Curry, H. Lee Ward, Anthony Skjellum, Ron Brightwell. 3rd Petascale Data Storage Workshop held in conjunction with SC08, Austin, TX. Nov. 17, 2008.

9. *Using the Sirocco File System for High-Bandwidth Checkpoints.* Matthew L. Curry, Ruth Klundt, H. Lee Ward. Technical Report. SAND2012-1087.

10. *A Highly Reliable GPU-based RAID System.* Matthew L. Curry. Doctoral thesis, University of Alabama at Birmingham, 2010, 141 pages. Available online: `http://www.mhsl.uab.edu/dt/2010p/curry.pdf`.

1.6 Synergistic Activities

- Member of the Board of Directors for the New Mexico Supercomputing Challenge (`http://www.supercomputingchallenge.org/about/`.

- Sandia POC for the DOE Storage Fast-Forward 2 effort.

1.7 Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers

- Purushotham V. Bangalore; University of Alabama at Birmingham (collaborator)

- Ron Brightwell; Sandia National Laboratories (co-author, collaborator)

- Phil Carns; Argonne National Laboratory (co-author, collaborator)

- Geoff Danielson; Sandia National Laboratories (collaborator)

- Jill Gemmill; Clemson University (co-author)

- Kevin Harms; Argonne National Laboratory (co-author)

- Jay Harris; Clemson University (co-author)

- Dries Kimpe; Argonne National Laboratory (co-author, collaborator)

- Ruth Klundt; Sandia National Laboratories (co-author)

- Thomas Kroeger; Sandia National Laboratories (collaborator)

- Darrell Long; University of California-Santa Cruz (collaborator)

- Carlos Maltzahn; University of California-Santa Cruz (co-author, collaborator)

- Ethan Miller; University of California-Santa Cruz (collaborator)

- Ron Oldfield; Sandia National Laboratories (collaborator)

- David R. Resnick; Sandia National Laboratories (co-author)

- Robert Ricci; University of Utah (co-author)

- Robert Ross; Argonne National Laboratory (co-author, collaborator)

- Haiying Shen; Clemson University (collaborator)

- Anthony Skjellum; Auburn University (co-author, collaborator, Ph.D. advisor)

- Weibin Sun; Google (co-author)

- Zhiwei Sun; Data Direct Networks (co-author, collaborator)

- Lee Ward; Sandia National Laboratories (co-author, collaborator)