

# 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 (coauthor). 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 (coauthor, 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).