

**Curriculum Vita**  
**Tara M. Madhyastha**  
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**Work**

Department of Computer Engineering  
Jack Baskin School of Engineering  
University of California  
Santa Cruz, CA 95064  
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**Home**

6602 34th Ave NW  
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**EMPLOYMENT HISTORY**

- 2001– Assistant Professor, Computer Engineering, University of California, Santa Cruz
- Summer 2001 Visiting Professor, Lawrence Livermore National Labs
- 1999–2001 Assistant Professor, Computer Science, University of California, Santa Cruz
- 1997–1999 Postdoctoral Research Fellow, Carnegie-Mellon University.  
Examined new application and system-level interfaces for optimizing I/O intensive access patterns. Investigated the use of data mining techniques for I/O workload characterization. Postdoctoral Advisor: Garth Gibson.
- 1990–1997 Research Assistant, University of Illinois at Urbana-Champaign.  
My thesis research demonstrated that it is possible to automatically classify certain important parallel I/O access patterns and use this information to tune file system policies. I assisted in the design of a portable user-level parallel file system used to validate this research. Thesis Advisor: Daniel Reed.
- Summer 1993 Research Assistant, NASA Goddard Space Flight Center, Greenbelt MD.  
Characterized file access patterns of I/O bound satellite image data processing codes.
- Summer 1992 Summer Intern, Supercomputing Research Center, Bowie, MD.  
Improved usability of the Performance Monitor (PM) System for the Tera simulator.
- 1986–90 Student Systems Programmer, Rutgers University, New Brunswick, NJ.

**EDUCATION**

- Ph.D. 1997 Computer Science, University of Illinois at Urbana-Champaign.  
Thesis title: *Automatic Classification of Input/Output Access Patterns*.  
Advisor: Dr. Daniel A. Reed.
- MS 1992 Computer Science, University of Illinois at Urbana-Champaign.  
Thesis title: *Personify: A Portable Framework for Data Sonification*.  
Advisor: Dr. Daniel A. Reed.
- BA 1990 Computer Science and English with Henry Rutgers Honors, Rutgers College, Rutgers University, New Jersey.

## GRANTS AND AWARDS

- 2001 Lawrence Livermore National Labs, Dynamically Replicated Storage, PI: Tara Madhyastha. \$20K.
- 2000–2004 NSF #CCR0093051 , *CAREER: A Program of Reserch and Education in Storage Systems Design for New Technologies*, PI: Tara Madhyastha. \$300K.
- 2000–2001 NSF #CCLI0088881 (co-PI), *Virtual and Physical Laboratories for Active Learning of Electronic Materials*, PI: Ali Shakouri, co-PI: Tara Madhyastha. \$74K.
- 2000–2002 NSF #ACI0090271, *COLLABORATIVE RESEARCH: Adaptive Data Parallel Storage*, PI: Tara Madhyastha, co-PI: Evgenia Smirni (College of William and Mary). \$400K total, \$248K UCSC subaward.
- 2000–2002 NSF #IDM0083130 (co-PI), *COLLABORATIVE RESEARCH: Data Mining Meets I/O Performance Evaluation: Advanced Statistical Tools for Analyzing Bursty Traffic*, PI: Christos Faloutsos (Carnegie Mellon University), co-PI: Ngai Hang Chan (Carnegie Mellon University), co-PI Tara Madhyastha. \$600K total, \$200K UCSC subaward.
- 2000–2002 NSF #CCR0073509 (co-PI), *Architectures and Algorithms to Exploit Probe-Based Storage*, PI: Darrell Long, co-PI Scott Brandt, co-PI Tara Madhyastha. \$589K.
- 2000–2001 Hewlett-Packard Labs, Sponsored Research Agreement for MEMS/ARS Simulation, \$35K (fiscal year ended before legal agreement negotiated).
- 2000–2001 UCSC Course Development Fellowship, \$7K.
- 1997–1999 NSF CISE Postdoctoral Research Associateship, \$42K.
- 1995–1997 NASA Graduate Student Research Program Fellowship, JPL, \$16K/year.
- 1996 NSF Travel Grant, CRA Workshop on Academic Careers for Women in Computer Science and FCRC
- 1988–1989 Rutgers College Special Merit Travel Grant, USENIX
- 1986–1990 Rutgers University Presidential Scholar (tuition and stipend)
- 1986–1990 Garden State Distinguished Scholar

## HONORS

- 1989 Phi Beta Kappa
- 1986–90 Rutgers College General Honors Program
- 1987 Dean's Award for Academic Excellence

## PUBLICATIONS

### Software Released

Educational applets for Properties of Materials. Available at [www.collage.soe.ucsc.edu](http://www.collage.soe.ucsc.edu).

Peer editing service. Available at [www.collage.soe.ucsc.edu](http://www.collage.soe.ucsc.edu).

Pablo – Performance analysis toolkit. Contributed to design and implementation of various releases; most recently I/O instrumentation.

Available at <http://www-pablo.cs.uiuc.edu/Software/Pablo/pablo.htm>

Porsonify – A portable data sonification toolkit.

Available at <http://www-pablo.cs.uiuc.edu/Project/Pablo/PabloSonification.htm>

## Refereed Journal Papers

1. Madhyastha, T. M., and Reed, D. A. “Learning to Classify Parallel Input/Output Access Patterns”. *IEEE Transactions on Parallel and Distributed Systems*, to appear.
2. Madhyastha, T. M., and Reed, D. A. “Data Sonification: Do You See What I Hear?” *IEEE Software*, March 1995.

## Refereed Conference Papers

1. Dramaliev, Ivan and Madhyastha, T. M. “Optimizing Probe-Based Storage”, in Proceedings of the 2nd USENIX Conference on File and Storage Technologies, San Francisco, CA, April 2003.
2. Masters, J., Madhyastha, T. M. and Shakouri, A. “ExplaNet: A Framework to Manage and Analyze Student-Authoring Course Content,” in Proceedings of the ASEE 2003 Annual Conference and Exposition, Nashville, TN, June 2003.
3. Madhyastha, T. M. “Teaching Technical Writing for Computer Engineers Using the Web”, in Frontiers of Education, Boston, MA, October 2002.
4. Masters, J., Madhyastha, T. M. and Shakouri, A. “Educational Applets for Active Learning in Properties of Materials”, in Frontiers of Education, Boston, MA, October 2002.
5. Sivan-Zimet, M. and Madhyastha, T. M. “Workload Based Modeling of Probe-Based Storage”, Short paper in Proceedings of Sigmetrics, Marina Del Ray, CA 2002.
6. Wang, Mengzhi, Madhyastha, T. M., Papadimitriou, Spiros, Chan, N. H. and Faloutsos, Christos “Data Mining Meets Performance Evaluation: Fast Algorithms for Modeling Bursty Traffic”, In Proceedings of the 18th International Conference on Data Engineering, San Jose, CA, 2002.
7. Madhyastha, T. M., Yang, K. P., and Yellin, J. Physical Modeling of Probe-Based Storage. In Proceedings of the 9th NASA Goddard Conference on Mass Storage Systems and Technologies., April 2001.
8. Madhyastha, T. M., Gibson, G. A., and Faloutsos, C. “Informed Prefetching for Collective Input/Output”, in *Proceedings of SC’99*, November 1999.
9. Madhyastha, T. M., and Reed, D. A. “Input/Output Access Pattern Classification Using Hidden Markov Models”, in *Workshop on Input/Output in Parallel and Distributed Systems*, pp. 57–67, November 1997.
10. Madhyastha, T. M., and Reed, D. A. “Exploiting Global Access Pattern Classification”, in *Proceedings of SC’97*, November 1997.
11. Madhyastha, T. M., and Reed, D. A. “Intelligent, Adaptive File System Policy Selection”, in *Proceedings of the Sixth Symposium on the Frontiers of Massively Parallel Computation*, pp. 172–179, October 1996.
12. Madhyastha, T. M., Elford, C. L., and Reed, D. A. “Optimizing Input/Output Using Adaptive File System Policies”, in *Fifth NASA Goddard Conference on Mass Storage Systems and Technologies*, September 1996.
13. Reed, D. A., Elford, C. L., Madhyastha, T., Smirni, E., and Lamm, S. L. “The Next Frontier: Interactive and Closed Loop Performance Steering”, in *Proceedings of the 1996 International Conference on Parallel Processing Workshop*, pp. 20–31, August 1996.
14. Reed, D. A., Elford, C. L., Madhyastha, T., Scullin, W. H., Aydt, R. A., and Smirni, E. “I/O, Performance Analysis, and Performance Data Immersion”, in *Proceedings of MASCOTS ’96*, pp. 1–12, February 1996.
15. Madhyastha, T. M., and Reed, D. A. “A Framework for Sonification Design”, in *Auditory Display: Sonification, Audification and Auditory Interfaces*, Addison-Wesley, 1992.
16. Reed, D. A., Olson, R. D., Aydt, R. A., Madhyastha, T. M., Birkett, T., Jensen, D. W., Nazief, B. A. A., and Totty, B. K. “Scalable Performance Environments for Parallel Systems”, in *Proc. of the Sixth Distributed Memory Computing Conference*, IEEE Computer Society Press, pp. 562 – 569, 1991.

## Technical Reports

1. Vaidyanathan, P. and Madhyastha, T. M. Input/Output Scalability of Genomic Alignment: How to Configure a Computational Biology Cluster. Lawrence Livermore National Labs, Technical Report UCRL-JC-145770, October 2001.
2. Hong, Bo and Madhyastha, T. M. The Relevance of Long-Range Dependence in Disk Traffic and Implications for Trace Synthesis. Technical Report UCSC-CRL-02-13, March 2002.
3. Hong, Bo, Madhyastha, T. M. and Zhang, B. Cluster-Based Input/Output Trace Synthesis. Technical Report UCSC-CRL-02-18, March 2002.
4. Madhyastha, T. M. "Automatic Classification of Input/Output Access Patterns", Technical report, University of Illinois at Urbana-Champaign, Department of Computer Science, August 1997.
5. Reed, D. A., Aydt, R. A., Madhyastha, T. M., Noe, R. J., Shields, K. A., and Schwartz, B. W. "The Pablo Performance Analysis Environment", Technical report, University of Illinois at Urbana-Champaign, Department of Computer Science, November 1992.
6. Madhyastha, T. M. "Porsonify User's Guide", Technical report, University of Illinois at Urbana-Champaign, Department of Computer Science, April 1992.
7. Madhyastha, T. M. "Porsonify: A Portable System for Data Sonification", Technical report, University of Illinois at Urbana-Champaign, Department of Computer Science, April 1992.

## PROFESSIONAL ACTIVITIES

### Program Committees

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|-----------|---|
| 2002      | PACT: Symposium on Parallel Architectures and Compiler Technology. Program committee.                                   |
| 2001–2002 | SC'02: High Performance Networking and Computing Conference. Executive Program Committee and Co-Chair of HPC Challenge. |
| 2000      | SC'00: High Performance Networking and Computing Conference. Program committee and judge for Best Student Paper Awards. |
| 1999      | Sixth Workshop on Input/Output in Parallel and Distributed Systems. Program Committee.                                  |

### Referee

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| 2002 | Performance Evaluation Review  |
| 2001 | 8th International Symposium on High-Performance Computer Architecture  |
| 2000 | ACM Transactions on Computer Systems   |
| 2000 | IEEE Transactions on Parallel and Distributed Systems<br>EuroPar   |
| 1998 | Reviewer for The Israel Science Foundation<br>5th International Conference on High Performance Computing<br>SIGMETRICS |
| 1995 | International Conference on Supercomputing   |
| 1993 | IEEE Transactions on Parallel and Distributed Systems  |

### Other Professional Service

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| 2000 | Publicity Coordinator, 15th Annual International Parallel and Distributed Processing Symposium |
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### **Invited Seminars**

- 2002 “Performance Characteristics of Probe-Based Storage”, International Probe Storage Workshop, Carnegie-Mellon University, November 2002.
- 2001 “Physical Modeling of Probe-Based Storage”, National Storage Industry Consortium Alternative Storage Technologies Symposium, Monterey, June 2001.
- 1998 “Automatic Classification of Input/Output Access Patterns”, Hewlett-Packard Labs, April 1998.
- 1996 “Intelligent, Adaptive File System Policies”, NASA Jet Propulsion Laboratory, August 1996.

### **External Activities**

- 2000 WebTutor Author, Brooks/Cole Publishing. Developed Web-based notes and quizzes for *Understanding Operating Systems* by Flynn and McHoes.

### **Conferences Attended**

- 1992,1996,1998–2001 SC’XY: The International Conference for High Performance Computing and Communications
- 2000,2002 SIGMETRICS: International Conference on Measurement and Modeling of Computer Systems
- 2001 NASA Goddard Conference on Mass Storage Systems and Technologies

### **UNIVERSITY SERVICE**

#### **Department and School Service**

- 2001–2002 Writing in the Disciplines (University committee)  
Academic Resources Advisory Committee (University committee)  
Mobile Computing Committee (University committee)  
Support for UCSC Summer Bridge with Peer Editing Software  
Faculty Advisor, Society of Women Engineers (SWE) at UCSC  
Faculty Representative, Mentornet  
CE Graduate Student Recruitment Committee  
CE Faculty Search Committee  
CE Faculty Candidate Interviews  
Undergraduate Engineering Honors Society  
Santa Cruz Faculty Association Membership Committee
- 2000–2001 Founder of Society of Women Engineers (SWE) at UCSC  
CS Faculty Search Committee  
CE Faculty Candidate Interviews  
CS Graduate Student Recruitment Committee  
CS Special Academic Honesty Committee  
CS Faculty Search Committee  
CE185 (Technical Writing for Computer Engineers) course revisors
- 1999–2000 CS Faculty Search Committee  
CS Graduate Student Recruitment Committee  
CS Comprehensive Examination Committee

## TEACHING 2001–02

Technical Writing for Computer Engineers (undergraduate)  
Cluster Computing and the Grid (graduate)  
Introduction to Data Structures (undergraduate)

## TEACHING 2000–01

Topics in Data Storage Systems (graduate)  
Technical Writing for Computer Engineers (undergraduate)

## TEACHING 1999–00

Compiler Design (graduate)  
Technical Writing for Computer Engineers (undergraduate)

## OTHER TEACHING

### Theses Supervised

2002	Preethy Vaidyanathan	CS	DSOARS: A User-Level Library for Dynamic Replicated Storage
2002	Jessica Masters	CS	Educational Applets for Active Learning in Properties of Materials
2002	Bo Hong	CE	Techniques for Synthetic I/O Workload Generation
2001	David Gatwood	CS	Cleaning the Cleaner for the Linux Log-Structured File System
2001	Miriam Sivan-Zimet	CS	Workload-Based Optimization of Probe-Based Storage

### Research Advisor to Continuing Graduate Students

PhD	Jessica Masters	Computer Science
PhD	Preethy Vaidyanathan	Computer Science
PhD	Ivan Dramaliev	Computer Science
MS	Vidhya Jayakrishnan	Computer Science

### Undergraduate Research Supervision

2002	Michelle Enyeart	Online gradebook, software engineering Supported by CRA-W Award
2002	Michael Nguyen	Dynamic file replication
2002	Leslie Clark	Peer editing assignment algorithm
2002	Phuong Nguyen	Educational applets, web access tracking
2002	Justin Burke	Adaptive disk cache prefetching
2001	Jael Aumack	Peer editing software, documentation
2001	Micah Carlin-Goldberg	Disk cache partitioning
2001	Noah Constant	Adaptive disk cache prefetching First Place, Undergraduate Research Day, Sept 18, 2001 Selected for UC Day 2001 (declined award)

## References

Dr. Daniel A. Reed, Gutgsell Professor and Director, NCSA  
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University of Illinois at Urbana-Champaign  
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Phone: (217) 333-3807, email: reed@cs.uiuc.edu

Dr. Christos Faloustos, Associate Professor  
School of Computer Science  
Carnegie-Mellon University  
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Dr. Richard Hughey, Chair  
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