

# Clay Breshears

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## Education

Ph.D.	Computer Science	University of Tennessee, Knoxville, TN.
M.S.	Computer Science	Washington State University, Pullman, WA.
B.S.	Computer Science	Eastern Washington University, Cheney, WA.

## Employment History

<b>Lecturer</b> <i>Eastern Washington University, Cheney, WA</i>	<b>9/20 - present</b>
<b>Principal Engineer</b> <i>Omics Data Automation, Beaverton, OR</i>	<b>6/17 - 6/20</b>
<b>Senior Software Technical Consulting Engineer</b> <i>Intel Developer Products Division - Technical Computing, Analyzers &amp; Runtimes, Hillsboro, OR</i>	<b>1/16 - 6/16</b>
<b>Life Sciences Software Architect</b> <i>Intel Health &amp; Life Sciences Group, Hillsboro, OR</i>	<b>9/12 - 12/15</b>
<b>Tech Analyst</b> <i>Intel Parallel Applications Center, Champaign, IL</i>	<b>10/11 - 8/12</b>
<b>Senior Parallel Programming Specialist</b> <i>Intel Parallel Applications Center, Champaign, IL</i>	<b>6/05 - 10/11</b>
<b>Senior Parallel Applications Engineer</b> <i>Intel Parallel Applications Center, Champaign, IL</i>	<b>9/00 - 6/05</b>
<b>Research Scientist, SPP Tools Lead</b> <i>Center for Research on Parallel Computation, Rice University, Houston, TX DoD HPCMP PET Initiative, U.S. Army ERDC MSRC, Vicksburg, MS</i>	<b>6/97 - 8/00</b>
<b>Assistant Professor</b> <i>Department of Computer Science and Statistics, University of Southern Mississippi, Hattiesburg, MS</i>	<b>8/95 - 5/97</b>
<b>Systems Engineer</b> <i>ApoCom Inc., Knoxville, TN</i>	<b>8/94 - 7/95</b>
<b>Graduate Research Assistant</b> <i>Joint Institute for Computational Science, University of Tennessee, Knoxville, TN</i>	<b>6/93 - 8/94</b>

**Graduate Research Assistant**

**8/89 - 6/93**

*Department of Computer Science, University of Tennessee, Knoxville, TN; Dr. Michael A. Langston*

**Instructor**

**9/85 - 8/89**

*Department of Computer Science, Eastern Washington University, Cheney, WA*

## **Skills**

### **High Performance and Parallel Computers**

Various Intel processors (Pentium, Xeon, Xeon Phi), SGI/Cray T3E, IBM SP, SGI Origin 2000 and Power Challenge Array, Thinking Machines CM-2 and CM-5 (w/ CMMD, PVM, MPI) and others.

### **Languages and Programming**

Extensive experience with C/C++, Fortran and various parallel dialects of same; use of multithreading APIs (OpenMP, Intel Threading Building Blocks, Win32 threads, POSIX threads); distributed memory programming with MPI and PVM. Familiar with Python. Built and executed codes on UNIX, Linux, and Windows.

### **Programming Tools and Libraries**

Intel Parallel Studio (VTune-Amplifier, Advisor, etc.); Intel TraceAnalyzer and Collector; Intel C++ and Fortran compilers; Microsoft Visual Studio; gcc, make, cmake3, git-based repositories. Package experience includes Intel Math Kernel Library, LAPACK and ScaLAPACK, PETSc, various MPI libraries.

## **Selected Publications**

Hamid Mohamadi, Benjamin P Vandervalk, Anthony Raymond, Shaun D Jackman, Justin Chu, Clay P Breshears, and Inanc Birol, "DIDA: Distributed Indexing Dispatched Alignment," PLOS One, <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126409>.

*The Art of Concurrency*, O'Reilly Media, 2009.

Several articles and overall editor for the *Intel Guide for Developing Multithreaded Applications*, Intel Developer Zone. <https://software.intel.com/en-us/node/165938>

Henry A. Gabb, Clay P. Breshears, and Gergana Slavova, "Hybrid Parallelism: Where's the Benefit?" *9th LCI International Conference on High-Performance Clustered Computing*, May 2008.

Phu Luong, Clay P. Breshears, and Le N. Ly, "Application of Multiblock Grid and Dual-Level Parallelism in Coastal Ocean Circulation Modeling," *Journal of Scientific Computing*, Vol. 20, No. 2, April 2004, pp. 257–275.

Richard J. Hanson, Clay P. Breshears, and Henry A. Gabb, "Algorithm 821: A Fortran Interface to POSIX Threads," *ACM Transactions on Mathematical Software (TOMS)*, Vol. 28, No. 3, September 2002, pp. 354–371.

Steve W. Bova, Clay P. Breshears, Henry Gabb, Bob Kuhn, Bill Magro, Rudolf Eigenman, Greg Gaertner, Stefano Salvini, and Howard Scott, "Parallel Programming with Message Passing and Directives," *Computing in Science and Engineering*, Vol. 3, No. 5, September/October 2001, pp. 22–37.

Phu V. Luong, Clay P. Breshears, and Le N. Ly, "Dual-Level Parallel and Multiblock Grids in Coastal Ocean Circulation Modeling," *Proceedings of the ISCA 13<sup>th</sup> International Conference on Parallel and Distributed Computing Systems*, August 2000, pp. 361-366.

S. W. Bova, Clay P. Breshears, Christine Cuicchi, Zeki Demirbilek, and Henry A. Gabb, "Dual-level Parallel Analysis of Harbor Wave Response Using MPI and OpenMP," *The International Journal of High Performance Computing Applications*, Vol. 14, No. 1, Spring 2000, pp. 49–64.

Steve W. Bova, Clay P. Breshears, Christine Cuicchi, Zeki Demirbilek, and Henry Gabb, "Nesting OpenMP in an MPI Application," *Proceedings of the ISCA 12<sup>th</sup> International Conference on Parallel and Distributed Computing Systems*, August 1999, pp. 566-571.

Clay P. Breshears, Steve W. Bova, Christine Cuicchi, Zeki Demirbilek, and Henry A. Gabb, "Using MPI\_Connect to Distribute Parallel Applications Across Multiple Platforms," *Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA '99)*, July 1999, pp. 383-389.

Clay P. Breshears, "From Shared to Distributed Memory: Converting Non-Numeric Parallel Algorithms to Message Passing Interface (MPI)," *Proceedings of the Thirtieth Annual Hawaii International Conference on System Sciences, Volume 1 – Software Technology and Architecture*, January 1997, pp. 209-210.

Clay P. Breshears and Michael A. Langston, "Parallel Benchmarks and Comparison-Based Computing," *Parallel Computing: State-of-the-Art and Perspectives, Advances in Parallel Computing, Vol. 11*, Elsevier, 1996, pp. 581-584.

## Associations

Association for Computing Machinery (ACM), 1982-present.  
Upsilon Pi Epsilon (Computer Science Honor Society).

## Research Interests

Parallel, distributed, and concurrent computation; machine decision making in the context of imperfect information; space-optimal, nonnumeric parallel algorithms; application of causality theory.