

Ernie Chan

Born on January 29, 1982, in Houston, TX. United States citizen. Unmarried.

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Department of Computer Sciences
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Objective

My long-term objective is to secure a position in a research institute or university related to my expertise in high-performance computing.

Professional Experience

National Instruments Austin, TX
Software Engineer Intern June 2008 – August 2008
June 2007 – August 2007
Interfaced the Formal Linear Algebra Method Environment libraries and API to LabVIEW.

Argonne National Laboratory Argonne, IL
Research Aide Appointment June 2005 – August 2005
Developed and implemented collective communication algorithms on IBM Blue Gene/L.

Texas Advanced Computing Center Austin, TX
Undergraduate Research Assistant February 2004 – August 2004
Developed and implemented collective communication algorithms for large, commodity clusters.

Education

The University of Texas at Austin Austin, TX
Ph.D. Department of Computer Sciences August 2005 – Present
Dissertation: Application of Dependence Analysis and Data Flow Graph Scheduling at Runtime to Block Formulations of Matrix Computations
Advisor: Prof. Robert van de Geijn.

The University of Texas at Austin Austin, TX
B.S. Department of Computer Sciences August 2000 – May 2004
Graduated with Honors and Special Department Honors in Computer Sciences.

Teaching Experience

University of Virginia Charlottesville, VA
Graduate Teaching Assistant August 2004 – May 2005
Information Assurance, Intro to Computer Science, and Discrete Mathematics II.

Journal Publications

Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Robert A. van de Geijn, Field G. Van Zee, and Ernie Chan. Programming algorithms-by-blocks for matrix computations on multithreaded architectures. *ACM Transactions on Mathematical Software*. Accepted pending minor modifications.

Ernie Chan, Marcel Heimlich, Avi Purkayastha, and Robert van de Geijn. Collective communication: theory, practice, and experience. *Concurrency and Computation: Practice and Experience*, 19(13):1749–1783, July 5, 2007.

Conference Publications

Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Ernie Chan, Robert van de Geijn, and Field G. Van Zee. Design of scalable dense linear algebra libraries for multithreaded architectures: the LU factorization. In *MTAAP'08: Proceedings of the 2008 Workshop on Multithreaded Architectures and Applications*, Miami, FL, USA, April 18, 2008.

Ernie Chan, Field G. Van Zee, Paolo Bientinesi, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, and Robert van de Geijn. SuperMatrix: A multithreaded runtime scheduling system for algorithms-by-blocks. In *PPoPP'08: Proceedings of the Thirteenth ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, pages 123–132, Salt Lake City, UT, USA, February 20-23, 2008.

Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Ernie Chan, Robert A. van de Geijn, and Field G. Van Zee. Scheduling of QR factorization algorithms on SMP and multi-core architectures. In *PDP'08: Proceedings of the Sixteenth Euromicro International Conference on Parallel, Distributed and network-based Processing*. pages 301–310, Toulouse, France, February 13-15, 2008.

Ernie Chan, Field G. Van Zee, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, and Robert van de Geijn. Satisfying your dependencies with SuperMatrix. In *Cluster'07: Proceedings of the 2007 IEEE International Conference on Cluster Computing*, pages 91–99, Austin, TX, USA, September 17-20, 2007.

Ernie Chan, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, and Robert van de Geijn. SuperMatrix out-of-order scheduling of matrix operations for SMP and multi-core architectures. In *SPAA'07: Proceedings of the Nineteenth Annual ACM Symposium on Parallelism in Algorithms and Architectures*, pages 116–125, San Diego, CA, USA, June 9-11, 2007.

Ernie Chan, William Gropp, Rajeev Thakur, and Robert van de Geijn. Collective communication on architectures that support simultaneous communication over multiple links. In *PPoPP'06: Proceedings of the Eleventh ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, pages 2–11, New York, NY, USA, March 29-31, 2006.

Ernie W. Chan, Marcel F. Heimlich, Avi Purkayastha, and Robert A. van de Geijn. On optimizing collective communication. In *Cluster'04: Proceedings of the 2004 IEEE International Conference on Cluster Computing*, pages 145–155, San Diego, CA, USA, September 20-23, 2004.

Technical Reports

Maribel Castillo, Ernie Chan, Francisco D. Igual, Rafael Mayo, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, Robert van de Geijn, and Field G. Van Zee. “Making Programming Synonymous with Programming for Linear Algebra Libraries.” The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-08-20. April 17, 2008. 13 pages.

Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Robert van de Geijn, Field G. Van Zee, and Ernie Chan. “Programming Algorithms-by-Blocks for Matrix Computations on Multithreaded Architectures.” The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-08-04. January 15, 2008. 20 pages.

Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Ernie Chan, Robert A. van de Geijn, and Field G. Van Zee. “Design and Scheduling of an Algorithm-by-Blocks for LU Factorization on Multithreaded Architectures.” The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-07-50. September 19, 2007. 16 pages.

Ernie Chan, Field G. Van Zee, Paolo Bientinesi, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, and Robert van de Geijn. “SuperMatrix: A Multithreaded Runtime Scheduling System for Algorithms-by-Blocks.” The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-07-41. August 22, 2007. 13 pages.

Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Ernie Chan, Robert A. van de Geijn, and Field G. Van Zee. “Scheduling of QR Factorization Algorithms on SMP and Multi-Core Architectures.” The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-07-37. July 31, 2007. 15 pages.

Ernie Chan, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, and Robert van de Geijn. “SuperMatrix Out-of-Order Scheduling of Matrix Operations for SMP and Multi-Core Architectures.” The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-06-67. December 18, 2006. 12 pages.

Ernie Chan, Marcel Heimlich, Avi Purkayastha, and Robert van de Geijn. “Collective Communication: Theory, Practice, and Experience.” The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-06-44. September 26, 2006. 32 pages.

Languages

Fluent in English.

Conversational in Chinese (Cantonese).

Awards

UTCS Student Travel Grant for *SIAM PP'08* conference, March 2008.

Student Travel Grant at *PPoPP'08* conference, February 2008.

Student Travel Grant at *PPoPP'06* conference, March 2006.

Student Travel Grant at *Cluster'04* conference, September 2004.

Service

Undergraduate Studies Faculty Committee for Department of Computer Sciences at the University of Texas at Austin, September 2007 – Present. Review and revamp undergraduate curriculum.

Journal reviewer for *Scientific Programming Special Issue on High Performance Computing on Cell B.E. Processors*, June 2008.

Conference reviewer for *SPAA'07*, January 2007.

Journal reviewer for *IEEE Transactions on Parallel and Distributed Systems*, August 2006.

Talks

Dense Linear Algebra on Multicore Architectures: What Kind of Parallelism?
SIAM Conference on Parallel Processing for Scientific Computing, March 2008.

SuperMatrix Out-of-Order Scheduling of Matrix Operations for SMP and Multi-Core Architectures.
IBM T.J. Watson Research Center, March 2007. Host: Dr. John Gunnels.

Collective Communication: Theory, Implementation, and Experience.
Argonne National Laboratory, March 2005. Host: Dr. Rajeev Thakur.

Software

SuperMatrix: Transparent parallelization of matrix operations for multithreaded architectures. Written in C using OpenMP and POSIX threads API and built into libFLAME.
<http://www.tacc.utexas.edu/resources/software/>

InterCol: A plug compatible collective communication library for MPI. Written in C and is portable to any large, commodity cluster.
<http://www.tacc.utexas.edu/resources/software/>

References

Prof. William Gropp, Department of Computer Science. University of Illinois at Urbana-Champaign.
Phone: (217) 244-6720, Fax: (217) 265-6738, wgropp@uiuc.edu

Prof. Enrique S. Quintana-Ortí, Departamento de Ingeniería y Ciencia de Computadores, Universidad Jaime I. Spain. Phone: (+34) 964-728257, Fax: (+34) 964-728486, quintana@icc.uji.es

Prof. Robert van de Geijn, Department of Computer Sciences, The University of Texas at Austin.
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