Brian R. Toonen

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EDUCATION

Fall 1995 to Present — **University of Wisconsin, Madison, WI**
M.S. in Computer Science.
Excepted Graduation Date: May 1997.

Fall 1988 to Fall 1992 — **University of Wisconsin Oshkosh, Oshkosh, WI**
B.S. in Computer Science with an emphasis in Electronics and Instrumentation.
GPA (four point scale): 4.0 in major; 3.83 cumulative.
Graduated: *Magna cum laude* in January 1993.

Fall 1987 to Spring 1988 — **Lawrence University, Appleton, WI**
Special student status to study Calculus during high school.

PUBLICATIONS

I. T. Foster, B. Toonen and P. H. Worley, "Performance of Massively Parallel Computers for Spectral Atmospheric Models", *Journal of Atmospheric and Oceanic Technology*, 13(5):1031–45, October, 1996.

J. B. Drake, I. T. Foster, J. G. Michalakes, B. Toonen, and P. H. Worley, "Design and Performance of a Scalable Parallel Community Climate Model", *Parallel Computing*, December, 1995.

P. H. Worley and B. Toonen, "A Users' Guide to PSTSWM", ORNL Technical Report ORNL/TM-12779, July 1995.

P. H. Worley, I. T. Foster and B. Toonen, "Algorithm Comparison and Benchmarking Using a Parallel Spectral Transform Shallow Water Model", *Proc. Sixth Workshop on Parallel Processing in Meteorology*, World Scientific, Singapore, 1995.

I. Foster and B. Toonen, "Load-Balancing Algorithms for the Parallel Community Climate Model", ANL/MCS-TM-190, January, 1995.

I. Foster and B. Toonen, "Load Balancing Algorithms for Climate Models", *Proc. SHPCC '94*, May, 1994.

J. Drake et al., "PCCM2: A GCM Adapted for Scalable Parallel Computers", *Proc. 5th Global Change Symp.*, American Meteorological Society, 1994.

WORK EXPERIENCE

June 1996 to present — **University of Wisconsin, Madison, WI**
During a research assistantship in the Computer Sciences Department, I have concentrated my efforts on improving the performance and reliability of distributed shared memory systems. As a member of the Wisconsin Wind Tunnel group, I have examined techniques for integrating fault tolerance into a DSM environment. Additionally, as part of a collaborative effort, I have investigated the sensitivity of several DSM protocols to changes in coherence granularity. A paper detailing the results of this research has been accepted for presentation at 6th Symposium on Principles and Practice of Parallel Programming.

September 1995 to May 1996	**University of Wisconsin, Madison, WI** As a teaching assistant for Machine Organization and Basic Systems class, my duties included developing and maintaining class related software, creating homework solutions, grading homework, maintaining class records, and answering students' questions. Occasionally, I also served as a substitute instructor.
July 1993 to June 1995	**Northwestern University, Evanston, IL** Assigned permanently to Argonne National Laboratory to work under Ian Foster, I explored techniques for efficiently utilizing the communication networks installed in the IBM SP at Argonne, assisted in the study of transpose algorithms for FFT and Legendre transforms, and continued working with researchers at Argonne, Oak Ridge National Laboratory and the National Center for Atmospheric Research on the parallelization of the NCAR Community Climate Model. I also began exploring techniques to improve the efficiency and portability of the disk I/O algorithms used in chemistry applications [This work was continued under a special term appointment at ANL during July/August 1995].
January 1993 to June 1993	**Argonne National Laboratory, Argonne, IL** During a six month Special Term Appointment (STA) at Argonne National Laboratory, I investigated load balancing strategies for parallel version of the NCAR Community Climate Model. This work involved developing various static and run-time computed mappings and studying their effects on the load imbalances exhibited by the climate model. This project was a continuation of work I began during a previous appointment at Argonne.
September 1990 to January 1993	**BRT Consulting, Neenah, WI** As the owner and operator of BRT Consulting, I provided analysis, design and development services to local area businesses including ERA ACRE Reality, Micro House, Inc., and James River Corporation. Areas of consultation included database and accounting systems, image analysis systems utilizing DSP technology, and various laboratory instrumentation and data analysis systems.
Summer 1992	**James River Corporation, Neenah, WI** During my fourth summer internship at James River, I developed an algorithm to model various paper properties using image analysis. The image analysis system consisted of a WE32C DSP board and a frame grabber in a 486 box. It was necessary to develop systems level software which supported synchronization and data communication, allowing the DSP to perform the imaging computations while the 486 performed rudimentary statistical calculations as well as disk and frame grabber I/O. Some DSP assembly language coding was also required to obtain optimal performance. A company confidential technical memo was written detailing the algorithms and analysis techniques used by the system.
Spring 1992	**Argonne National Laboratory, Argonne, IL** During a Science and Engineering Research Semester Appointment at Argonne National Laboratory, I worked with Ian Foster and John Michalakes on the development of a configurable load balancing library for PCCM2, a parallel version of the NCAR Community Climate Model. This library was later used to explore potential load balancing strategies.

Summer 1990 and 1991	**James River Corporation, Neenah, WI** Employed as a summer intern at James River, I designed and developed a laboratory data tracking and analysis system to automate the Fiber Analysis Laboratory. Besides the normal database design process, this project included a detailed study of the testing process and analysis techniques used in the Fiber Lab. It also included a study of interpolation techniques to reduce the variability of normalized results. In addition to the laboratory project, I assisted the Computer Services Group with local area network installation and management.
September 1988 to May 1990 (excluding summer months)	**Richard W. Koehn Institute for Information Systems and Automation, Oshkosh, WI** As an Honors Intern of the Koehn Institute, I was responsible for the design and development of various specialty database systems for local area businesses. I also served as a consultant during the installation of several local area networks.
Summer 1989	**James River Corporation, Neenah, WI** As a summer intern at James River, I developed data acquisition and analysis programs for various test instruments in the Physical Testing Laboratory. This project was motivated by the need to eliminate errors caused by hand entry of data. Tasks for this project included writing drivers for several hardware interfaces, creating a common and reusable user interface, designing and developing a laboratory request tracking system, and training laboratory technicians to properly use the software.

HONORS, AWARDS and RECOGNITIONS

Participant in the 1993 ACM International Collegiate Programming Competition

Third place in the 1992 ACM Regional Programming Contest

Third place in the 1991 ACM Regional Programming Contest

Association for Computing Machinery (ACM) member since 1991

Awarded the James River Scholarship each semester from Fall 1989 to Fall 1992

COMPUTER PROFICIENCY

Languages	C, C++, Fortran 77 & 90, Fortran M, Pascal, Perl, a multitude of assembly languages, and various Unix shells
Architectures	Cray T3D, IBM SPx, Intel Touchstone Delta, Intel iPSC/860, Wisconsin COW, Cray Y/MP, Sequent Symmetry, DEC Alpha, DEC VAX, HP, IBM RS/6000, NeXT, Sun, and IBM PC Compatibles (running DOS, Windows, Windows NT, and FreeBSD)
Parallel Development Tools	MPI, Chameleon, p4, PICL, and many vendor/architecture specific tools

INTERESTS and ACTIVITIES

Professional	Operating systems, distributed and parallel systems, high speed networks, security, accountability, compilers, and computer architecture
Personal	Bicycling, walking, hiking, camping, traveling, billiards, darts, home brewing, cooking, computing, electronics, and reading