

CURRICULUM VITAE

TIMOTHY HAROLD KAISER, PH.D.

Personal Information

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Education

Ph.D. Computer Science

1993 - 1997

University of New Mexico

Albuquerque, New Mexico

M.S. Electrical Engineering (Applied Physics)

1985 - 1987

University of California, San Diego

La Jolla, CA

B.S. Physics

1976 - 1981

University of Missouri Rolla

Rolla, MO

Internships

1995 - 1997 University of New Mexico

Albuquerque High Performance

Computing Center (Maui Project)

Research Assistant

1980 - 1981 University of Missouri Rolla

National Science Foundation Undergraduate

Research Grant

1977 Crane Naval Weapons Support Center

Crane Indiana

Student Work Co-op

Professional Experiences

February 1998 - Present

San Diego Supercomputer Center, University of California San Diego, Computer Scientist. Advised scientists in various disciplines on issues related to high performance computing. This included porting , maintaining, and improving a 3d finite difference earthquake program for use in an simulation portal. Developed a new boundary condition algorithm

for the simulation. Developed a Python parallel programming module. Helped debug and port biology applications for parallel platforms. Formally manager of Scientific Computing Services. Directed consulting services, resources, documentation efforts, developed, directed, planned, and taught workshops on computing technologies. Taught undergraduate computer science. Performed studies of new and emerging computing technologies. Served as a liaison to industrial and academic users. Fielded questions from users. Helped scientists with program optimization and advised on potential parallel program optimization opportunities. Participated as a board member in several professional computing organizations and meeting planning. Recently joined a group developing software for “grid” computing deployment. Developed a web-based system for easy installation of the Globus security infrastructure. Developing Teragrid test suite infrastructure. Developed an easy to use tool for dynamic instrumentation and performance profiling of grid and IBM SP programs. Developed and documented a method for porting MPI to a new architecture.

February 2002 - Present

Coherent Cognition, Chief Scientist. Created and run Coherent Cognition. Manage all aspects of the business including financial, research, network, and computer systems. Built a dynamic cluster to use in research efforts. Obtained funding from the Department of Defense for a software development effort. Developed a Collective Communications Module to make parallel programs easier to write. Releasing the Collective Communications Module as open source. Along with the University of Tennessee, obtained funding to develop methodologies and tools to promote program portability. Developed, deployed and populated a web-accessible database describing program portability issues.

September 85 - January 98

Science Applications International, (Educational leave of absence fall 92 to spring 97), Sr. Scientist. Performed scientific computation, model development, analysis and optimization studies. Developed distributed applications for data collection and analysis. Physical systems modeled and analyzed included: acoustic signal analysis, directed energy weapons, infrared and radar signature models, and detection, battle management systems, nuclear and conventional weapon effectiveness. Developed a unique methodology for the numerical solution of nonlinear differential equations. Developed Macintosh applications for computer animation and visualization.

February 94 - May 97

University of New Mexico - High Performance Computing Education and Research Center, (Maui Project), Research Assistant. Developed parallel scientific simulations. Developed and taught workshops on various topics in parallel distributed computing including: High Performance Fortran (HPF), Message Passing Interface, (MPI), Parallel Virtual Machine, (PVM), P4, and linear algebra. Developed and used a large-scale parallel finite difference simulation. Wrote documentation on parallel computer systems, networked workstations and the 400 node IBM/SP2 computer. Tested operating systems, compilers and message passing software including Fortran 90, HPF, P4 and MPI, Mach. Ported message passing systems, MPI and P4, to new architectures and operating systems. Created a parallel programming system for the Apple Macintosh. Answered questions from other professionals about parallel computing. Developed strategies for porting Fortran 77 programs to Fortran 90. Developed parallel numerical methods. Research interest: Strategies for parallelizing and performing load balancing for adaptive grid finite difference programs, Parallel Genetic Algorithms, Functional optimization techniques using calculus of variations, parallel numerical methods.

October 83 - September 85

General Dynamics - Convair, Sr. Engineer. Performed radar cross-section analysis and measurement. Principal investigator for the Directed Energy Weapons Operations Concepts Study. Developed force on force model including battle management and directed energy weapon propagation routines. Performed laser weapon effectiveness studies.

June 81 - October 83

Boeing Military Airplane Company, Electronic Counter Measures Engineer. Analyzed aircraft electronic and infrared defensive systems using both computer simulation and laboratory tests. Advised an operational analysis group on the validity of computer models related to laser systems. Developed and modified several models for laser and defensive systems. Developed and used test equipment for infrared and electronic counter measures systems.

Committees

- Parallel Tools Consortium Executive Committee, SDSC representative.
- SPSciComp Executive Committee (IBM Scientific Computing Interest Group) Treasure
- Workshop on OpenMP Applications and Tools, Planning Committee
- External reviewer for the National Resource Allocations Committee

Teaching and Mentoring Experience

- Summer 2005 MPI for Scientific Computing, Geon Summer Institute 2005
- Summer 2004 MPI for Scientific Computing, Geon Summer Institute 2004
- Spring 2003 Computer Science 505 Parallel Programming, San Diego State University
- 1998 - 2000 Head of High Performance Computing Training at the San Diego Supercomputer Center. Developed, organized and taught workshops for students and researchers on various aspects of computing, including:
 - Introduction to Parallel Programming
 - Moving from Fortran 77 to Fortran 90.
 - Introduction to MPI
 - Intermediate MPI
 - Advanced MPI for Scientific Computing using the Stommel Model
 - OpenMP
 - PESSL (IBM parallel scientific library)
 - Co-Array Fortran
 - Introduction to Parallel Architectures (IBM, Cray T90, Cray T3e, Cray SV1, SGI origin)
 - Workshops taught at:
 - University of California San Diego Supercomputer Center,
 - University of California San Francisco Medical School
 - Stanford University Economics Department
 - University of Michigan
 - NASA's Stennis Space Center
 - Johns Hopkins University Brain Imaging Center
- Fall 2000 - Spring 2001 NSF funded Research Experience For Undergraduates (advisor/mentor for several students)
- Spring 2001 Computer Science 164 Parallel Programming, University of California San Diego
- Summer 2001 Computer Science 199 Undergraduate Research, University of California San Diego
- Fall 2001 Computer Science 199 Undergraduate Research, University of California San Diego
- Fall 1995 - Spring 1996 High School Student mentoring Program, University of New Mexico
- 1987 - 1991 High School Church Youth Group Leader, San Diego, CA
- Fall 1979 Tutor for Introductory Physics, University of Missouri – Rolla

Recent Publications and Presentations

Tools for Parallel Programming. Invited talk, National Biomedical Computation Resource (NBCR) 2006 Summer Institute, August 2006.

T. Kaiser, L. Brieger, S. Healy. *MYMPI - MPI Programming in Python.* 2006 International Conference on Parallel and Distributed Processing Techniques & Applications, Las Vegas, NV, USA June 26-29, 2006, Proceedings, pp. 458-464, 2006.

Using a generalized MPI interface for Python, MYMPI, Presented at SciPy 2005 Conference - Python for Scientific Computing, CalTech, Pasadena, CA September 2005.

Synseis: a 3D Seismic Waveform Propagation Analysis Tool Invited talk, CIG/IRIS Workshop on Computational Seismology, June 2005.

C. Youn, T. Kaiser, C. Santini and D. Seber. *Design and Implementation of Services for a Synthetic Seismogram Calculation Tool on the Grid.* ICCS 2005: 5th International Conference, Atlanta, GA, USA, May 22-25, 2005,

Proceedings, Part 1, LNCS 3514, pp. 469-476, 2005

What's up with Teragrid Invited talk, Cyberinfrastructure for the Geosciences Meeting, June 2005.

Application Portability, Department of Defense Final Report, Contract No. N62306-01-D-7110, Project CE 04-003, May 2004.

A methodology for creating large modules, ACM SIGPLAN Fortran Forum archive Volume 22, Issue 3, pp. 2-10, (December 2003).

Semiautomatic Characterization of Fortran 90 Compilers, ACM SIGPLAN Fortran Forum archive Volume 22, Issue 3, pp 11-24, (December 2003).

Collective Communications Module Applications Programmers Interface, Department of Defense Final Report, Contract No. N62306-01-D-7110, Project CE 019, January 2003.

Collective Communications Module Reference Implementations, Netlib Entry <http://www.netlib.org/ccm/>, January 2003.

Collective Communication Module: Collectives Made Easy, Presented at Ptools 2002 Annual Meeting, Knoxville, TN, September 2002.

REPRINT: Program instrumentation tool, Presented at NPACI Summer Institute, University of California San Diego, August 2002.

IMPRINT: A Tool for Performance Monitoring and Application Steering, Presented at SCICOMP4, Knoxville, TN, October 2001.

Project Updates - Using Ptools Projects (DPCL/IMPRINT), Presented at Ptools 2001 Annual Meeting, San Diego, CA, May 2001.

Interactive Multimode Program Instrumentation Tool, Presented at SCICOMP3, Barcelona, Spain, May 2001.

T. Kaiser and S. Baden. *Overlapping Communication and Computation with OpenMP and MPI*. Scientific Programming, Volume 9, p 73 - 81 (November 2001).

Course grain parallelism in OpenMP with MPI, Presented at the Workshop on OpenMP Applications and Tools (WOMPAT 2000), San Diego, CA July 2000.

Dynamic Load Distributions for Adaptive Computations on MIMD Machines using Hybrid Genetic Algorithms, Ph.D. dissertation. University of New Mexico, December 1996.

Path Optimization using Parallel Methods with Calculus of Variations, University of New Mexico Technical Report CS95-7.

Scientific Visualization for Hydrodynamic Adaptive Grids, Physics Computing '93 Meeting of the American Physical Society. June 1993.