James Arthur Kohl
8941 Colchester Ridge Road, Knoxville, TN, 37922-1451
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## Education

**Ph.D.** December 1994, GPA: 3.96/4.00, 27 hours

Doctor of Philosophy in Electrical and Computer Engineering,
University of Iowa, Iowa City, IA, 52242.

Thesis: "Efficient Visualization and Animation of Program Behavior"

Defines a framework for fast prototyping of custom program views that reduces the specification overhead and complexity involved in building a view. Introduces two new constructs, the "Equate" and the "Replication." Equates provide efficient, high-level identification of cohesive view relationships. Replications provide a means for efficiently constructing large sets of graphical objects in regular patterns. A prototype view editing system, IMPROV, has been developed using this framework. Experimental results show that the views have more efficient specifications and improved execution performance.

Major Professor: Dr. T. L. Casavant

**M.S.E.E.** December 1989, GPA: 5.66/6.00, 18 hours

Master of Science in Electrical Engineering,
Purdue University, West Lafayette, IN, 47907

Thesis: "PARADISE: An Animated Parallel System Debugging and Simulation Environment"

Presents a design methodology and meta-tool for animating parallel software behavior using visual models made up of discrete graphical objects. Emphasis is on application of program visualization to debugging and performance tuning parallel software.

Major Professor: Dr. T. L. Casavant

**B.S.C.E.E.**, Summa Cum Laude December 1988, GPA: 5.88/6.00, 155 hours

Bachelor of Science in Computer and Electrical Engineering,
Purdue University, West Lafayette, IN, 47907

## Areas of Specialization:

Parallel and Heterogeneous Distributed Computing, Visualization of Parallel Program Behavior and Scientific Data, Graphical User-Interface Design, Computer Architecture.

## Professional Experience:

**Oak Ridge National Laboratory**, Oak Ridge, Tennessee, 37831-6367
*July 1993 to present.*
Full-time Research Staff II appointment in the Distributed Computing Group of the Distributed Intelligent Systems Section in the Computer Science and Mathematics Division. Perform research on various aspects of parallel and heterogeneous distributed computing and visualization of parallel programs and data, for basic sciences and applied mathematics applications. Developer and primary maintainer of the Parallel Virtual Machine (PVM) message-passing system. Developed a graphical user interface for PVM called XPVM, which monitors and visualizes the execution of PVM programs. Co-developed the CUMULVS system (Collaborative, User Migration, User Library for Visualization and Steering) for interactive data and algorithm visualization, collaborative computational steering and user-directed fault tolerance of parallel scientific computer simulations. Working with Regional Climate Assessment project to apply CUMULVS for coupling data fields across distinct simulation models. Member of Common Component Architecture (CCA) Forum, as part of DOE 2000, to define a standard specification for reusable software components in high-performance scientific computing. Designed and implemented a scalable sparse matrix viewer called MatView, for graphically viewing, exploring and analyzing very large sparse matrices. Work with the National HPCC Software Exchange (NHSE) on the Parallel Tools Library (PTLIB) project, as editor of the monthly email newsletter "PT Digest," and have also worked on the Parallel Tools Evaluation (PTE) effort to port existing parallel tools to state-of-the-art computer architectures. Involved in the design of numerous user interfaces for Unix and X Windows applications, as well as web-based HTML form and CGI script interfaces. Worked on the Collaborative Management Environment (CME) project for organizing DOE HQ financial information across the various field offices; developed web-based user interface for coordinating input of user financial queries and processing database accesses. Developed CGI web interface for DIXIE, a web-based remote control system for a spectrometer in ORNL's High Flux Isotope Reactor (HFIR). Member of the FaMOUS team for financial management; co-developed interface to use World-Wide Web for dissemination of concise financial reports. Have explored next-generation program visualization with IMPROV (completion of PhD Thesis work), an environment for interactively building custom graphical views of parallel programs.

**IBM Thomas J. Watson Research Center**, Yorktown Heights, New York, 10598
*May through September 1992.*
Summer/Fall Internship appointment. Worked with Doug Kimelman on the IBM Research PV Prototype program visualization system. Designed & implemented X Window System widgets for graphically animating large data arrays using a scalable view technique. (Details remain IBM Confidential pending publication or patent process.) Also, designed software monitoring system for collecting information on data array accesses, using the ParaSoft Express parallel programming system, on RS/6000 clusters and the Victor 256 Node Transputer. Re-designed existing software for converting Express traces for use with the PV Prototype. Assisted in the production of a video of the PV prototype, including operation of the video camera and the U-Matic audio/video editing system.

**Argonne National Laboratory**, Argonne, Illinois, 60439
*1984 through 1990, 7 Summers, Regular Short-Term Appointments.*
*Plus 1983-4 School Year, Co-Operative Education Program, Senior Year in High School.*
From 1986 through 1990 worked in Mathematics and Computer Science Division, in the Advanced Computing Research Facility (ACRF). During Summer 1990 implemented several parallel

versions of global climate modeling equations for the joint CHAMMP project (Computer Hardware/Applied Mathematics/Model Physics) using the Strand parallel programming language. During Summer 1989 worked with Jack Dongarra on development of the SHMAP (SHared Memory Access Patterns) tool for graphic visualization of memory accesses in matrix calculations for shared memory multi-processor systems. During earlier summers, 1986 through 1988, developed software for analyzing the performance of software on parallel and multiprocessor computers including Sequent Balance 21000, Alliant FX8, Encore Multimax 20, Connection Machine (CM-2), DAP - 1024 processor, and Intel 286 Hypercube and Vectorcube. Helped implement and debug a set of parallel programming macros, and sole developer of a Unix socket-based interprocess communications protocol for use with the macros. Worked on several projects involving automated theorem proving, artificial intelligence programming languages, combinational logic research, biological/genetic genome-matching software, mathematical algorithm development, and also handled system administrator duties for various periods. From 1983 through 1985 worked in Computer Services Division (now the Electronics & Computing Technologies Division) as a Research Assistant. Wrote general accounting and report generation software, debugged an extensive equipment inventory software system, and developed communications hardware control software for supercomputer batch access.

**University of Iowa**, Iowa City, Iowa, 52242
*Spring 1990 to Summer 1993, Department of Electrical and Computer Engineering.*
Research Assistant, worked on parallel software engineering and program visualization research. Teaching Assistant, Spring 1991, undergraduate introductory course in computer architecture. Teaching Assistant, Fall 1990, graduate level course in high-performance computing.

**Purdue University**, West Lafayette, Indiana, 47907
*1988-9 School Year, School of Electrical Engineering.*
Research assistant under Purdue Graduate School Fellowship, worked on program visualization of parallel and distributed systems. Teaching Assistant, Fall 1989, with split assignment, taught section of undergraduate laboratory course in advanced microprocessor design, and provided assistance for students in an electric circuit design and analysis course.

## Graduate Course and Research Summary:

**University of Iowa, Ph.D.:**
Extensive research in the design and development of parallel software, emphasizing the design and use of program visualization systems for debugging and performance evaluation. Research also involved consideration of several human-computer interface issues. Various course work in parallel programming, parallel & distributed computing, software engineering, combinatorial optimization, complexity and computation theory. Also some course work in computer networks, digital integrated electronic design, and graph theory and algorithms.

**Purdue University, M.S.E.E.:**
Research focused on the design and use of sophisticated program visualization tools, and their application to parallel software development. Course work covered a variety of electrical engineering topics, including high-performance computer architecture, distributed computing systems, artificial intelligence, probability theory, control theory, communication theory, and E/M theory.

## Journal / Conference Publications:

J. A. Kohl, G. A. Geist, "Monitoring and Steering of Large-Scale Distributed Simulations," IASTED International Conference on Applied Modeling and Simulation, September 1-3, 1999, Cairns, Queensland, Australia.

J. A. Kohl, P. M. Papadopoulos, "Efficient and Flexible Fault Tolerance and Migration of Scientific Simulations Using CUMULVS," Proceedings of the SIGMETRICS Symposium on Parallel and Distributed Tools (SPDT 98), The Resort at the Mountain, Welches, Oregon, August 3-4, 1998, pp. 60-71.

M. Beck, J. Dongarra, G. Fagg, A. Geist, P. Gray, J. Kohl, M. Migliardi, K. Moore, T. Moore, P. Papadopoulos, S. Scott, V. Sunderam, "HARNESS: A Next Generation Distributed Virtual Machine," Special Issue on Metacomputing, Future Generation Computer Systems, Elsevier Publishing, Volume 15, Numbers 5/6, 1999.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, S. L. Scott, "Beyond PVM 3.4: What We've Learned, What's Next, and Why," Special Issue on Metacomputing, Future Generation Computer Systems, Elsevier Publishing, Volume 15, Numbers 5/6, 1999, pp. 571-582.

J. Dongarra, A. Geist, J. Kohl, P. Papadopoulos, V. Sunderam, "HARNESS: Heterogeneous Adaptable Reconfigurable Networked Systems," Proceedings of High-Performance Distributed Computing (HPDC '98), February 1998.

P. M. Papadopoulos, J. A. Kohl, B. D. Semeraro, "CUMULVS: Extending a Generic Steering and Visualization Middleware for Application Fault-Tolerance of Parallel Applications," Proceedings of the 31st Hawaii International Conference on System Sciences (HICSS-31), Kona, HI, January 6-9, 1998, Volume 8, pp. 127-136.

J. A. Kohl, "High-Performance Computers: Innovative Assistants to Science," ORNL Review, Volume 30, Number 3 & 4, 1997, pp. 54-59.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, S. L. Scott, "Beyond PVM 3.4: What We've Learned, What's Next, and Why," Proceedings of Euro PVM-MPI 97, Krakow, Poland, November 1997.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, "CUMULVS: Providing Fault-Tolerance, Visualization and Steering of Parallel Applications," **Int'l Journal of High Performance Computing Applications**, Volume 11, Number 3, August 1997, pp. 224-236.

N. Grady, N. Nachtigal, M. Elmore, J. Kohl, J. Rome, J. Reed, P. Papadapoulos, "On-the-Fly Translation and Role-Based Authorization for Intranet Document Systems," WWW6 Conference, Santa Clara, CA, April 7, 1997.

J. A. Kohl, P. M. Papadopoulos, G. A. Geist, "CUMULVS: Collaborative Infrastructure for Developing Distributed Simulations," Eighth SIAM Conference on Parallel Processing for Scientific Computing, Minneapolis, MN, March 14-17, 1997.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, "CUMULVS: Providing Fault-Tolerance, Visualization and Steering of Parallel Applications," Environment and Tools for Parallel Scientific

Computing Workshop at Domaine de Faverges-de-la-Tour, Lyon, France, August 21-23, 1996

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, B. D. Semeraro, W. A. Shelton, "Early Experiences with Distributed Supercomputing on I-WAY: First-Principles Materials Science and Parallel Acoustic Wave Propagation," **Int'l Journal of Supercomputer Applications and High Performance Computing**, Volume 10, Number 2/3, Summer/Fall 1996.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos "PVM and MPI: A Comparison of Features," **Calculateurs Paralleles**, Volume 8, Number 2, June, 1996, pp. 137-150.

J. A. Kohl, G. A. Geist, "The PVM 3.4 Tracing Facility and XPVM 1.1," Proceedings of the 29th Hawaii International Conference on System Sciences (HICSS-29), Heterogeneous Processing Minitrack in the Software Technology Track, Maui, HI, January 3-6, 1996.

P. M. Papadopoulos, J. A. Kohl, "A library for Visualization and Steering of Distributed Simulations using PVM and AVS," High Performance Computing Symposium, Montreal, Canada, July 10-12, 1995.

K. Barnes, D. Flanagan, N. Grady, J. Green, F. Hoffman, J. Kohl, M. Leuze, P. Papadopoulos, R. Sincovec, "The Financial Management Environment (FaME) – A Prototype Interactive Hypertext-based Financial Planning and Reporting System," ORNL Technical Report, June, 1995.

J. A. Kohl, T. L. Casavant, "The IMPROV VDL: A Language for Efficient Development of Visualization Tools for Parallel Computing Systems," University of Iowa Technical Report, ECE-TR-051195, May, 1995.

J. A. Kohl, G. A. Geist, "XPVM 1.0 User's Guide," Technical Report ORNL/TM-12981, Oak Ridge National Laboratory, Oak Ridge, TN, April, 1995.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, "Visualization, Debugging, and Performance in PVM," Proceedings of Visualization and Debugging Workshop, Cape Cod, Massachusetts, October, 1994.

L. V. Kale, J. A. Kohl, N. Chrisochoides, K. Yelick, "Parallel Object-Oriented Software and Tools," Proceedings of POOMA 1994, **Scientific Computing**.

J. A. Kohl, T. L. Casavant, "Equate Relationships in the IMPROV Program Visualization Environment," Invited Presentation and Accompanying SIAM Journal Proceedings, **2nd Workshop on Environments and Tools for Parallel Scientific Computing**, Blackberry Farm, Townsend, TN, May 25-27, 1994.

J. A. Kohl, T. L. Casavant, "Creating Custom, Animated Views for Debugging and Performance Evaluation of Massively Parallel Supercomputers for Automotive Applications," 1993 Dedicated Conference on Supercomputers for Automotive Applications in the International Symposium on Automotive Technology and Automation (ISATA), Aachen, Germany, September, 1993, pp. 207-212.

T. L. Casavant, J. A. Kohl, "The IMPROV Meta-Tool Design Methodology for Visualization of Parallel Programs," Invited Paper, International Workshop on Modeling, Analysis, and Simu-

lation of Computer and Telecommunication Systems (MASCOTS), January 1993.

J. A. Kohl, T. L. Casavant, "A Software Engineering, Visualization Methodology for Parallel Processing Systems," Proceedings of the Sixteenth Annual International Computer Software & Applications Conference (COMPSAC), Chicago, Illinois, September 1992, pp. 51-56.

T. L. Casavant, J. A. Kohl, Y. E. Papelis, "Practical Use of Visualization for Parallel Systems," Invited Keynote Address Text for 1992 European Workshop on Parallel Computers (EWPC), Barcelona, Spain, March 23-24, 1992 (15 pages).

J. A. Kohl, "The Construction of Meta-Tools for Program Visualization of Parallel Software," Ph.D. Thesis Proposal (Passed February 19, 1992), Written Paper Accompanying Oral Comprehensive Examination, Technical Report Number TR-ECE-920204, Department of ECE, University of Iowa, Iowa City, IA, 52242, February 1992.

T. L. Casavant, J. A. Kohl, Y. E. Papelis, "Practical Use of Visualization for Parallel Systems," Technical Report Number TR-ECE-920102, Department of ECE, University of Iowa, Iowa City, IA, 52242, January 1992 (full version of EWPC 92 paper).

J. A. Kohl, T. L. Casavant, "PARADISE: A Meta-Tool for Program Visualization in Parallel Computing Systems," Technical Report Number TR-ECE-901011, Department of ECE, University of Iowa, Iowa City, IA, 52242, Revised December 1991.

J. A. Kohl, "Visual Techniques for Parallel Processing," Written Comprehensive Examination, University of Iowa, Department of Electrical and Computer Engineering, ECETR-910726, July 1991.

J. A. Kohl, T. L. Casavant, "Use of PARADISE: A Meta-Tool for Visualizing Parallel Systems," Proceedings of the Fifth International Parallel Processing Symposium (IPPS), Anaheim, California, May 1991, pp. 561-567.

J. J. Dongarra, O. Brewer, J. A. Kohl, and S. A. Fineberg, "A Tool to Aid in the Design, Implementation, and Understanding of Matrix Algorithms for Parallel Processors," **Journal of Parallel and Distributed Computing**, June 1990, pp. 185-202.

## Other Presentations and Meetings:

Attended and presented talk at Common Component Architecture (CCA) working group meeting, DOE 2000 ACTS Toolkit, Oak Ridge, TN, June 1999.

Attended Strategic Simulation Initiative (SSI) Computer Science Enabling Technologies (CSET) Meeting, Argonne National Laboratory, May 1999.

Attended Common Component Architecture (CCA) working group meeting, DOE 2000 ACTS Toolkit, Santa Fe, NM, April 1999.

Attended DOE 2000 ACTS Toolkit Principle Investigators Meeting, Reston, VA, March 1999.

Presented talk for CUMULVS Field Work Proposal (FWP) at DOE 2000 ACTS Toolkit Review, Reston, VA, January 1999.

Invited to Attend Workshop on Programming Environments, Clusters, and Computational Grids for Scientific Computing, The Inn at Blackberry Farm, Walland, TN, September 1998.

Invited to Attend the 1998 Annual Meeting of the Parallel Tools Consortium (PTOOLS '98), National Center for Atmospheric Research (NCAR), Boulder, CO, May 4-6, 1998.

J. A. Kohl, P. M. Papadopoulos, "Interfacing Parallel Scientific Applications with Multiple Visualization Systems: The CUMULVS Approach," Mathematical, Information, and Computational Sciences (MICS) Workshop on Interoperability of DOE Visualization Centers, Lawrence Berkeley National Laboratory, Berkeley, CA, March 30 - April 1, 1998 (see `http://www.epm.ornl.gov/harness/cumulvs/`).

Invited to Attend Army Research Laboratory (ARL) / Naval Oceanographic Office (NAVO) Workshop on the Role of High Performance Computing in Signal and Image Processing, ARL Major Shared Resource Center (MSRC), Higher Education and Applied Technology (HEAT) Center, Aberdeen, MD, February 3-5, 1998.

J. A. Kohl, G. A. Geist, P. H. Worley, M. Yethiraj, "DIXIE: Web-Based Remote Control of a Medium Resolution Double-Crystal Small-Angle Spectrometer," NOBUGS (New Opportunities for Better User Group Software) 1997, Argonne National Laboratory, Argonne, IL, December 10-12, 1997.

J. A. Kohl, G. A. Geist, P. M. Papadopoulos, B. D. Semeraro, "Heterogeneous Distributed Computing and Application Collaboration at ORNL," Presentation at Dow Chemical Collaboration Meeting, Oak Ridge National Laboratory, Oak Ridge, TN, November 3-4, 1997.

J. A. Kohl, "PVM and MPI: A Comparison of Features," Invited Presentation at IBM Fishkill, Video-Teleconferenced to 7 IBM sites, Fishkill, NY, August 20, 1997.

Invited to Attend Gordon Research Conference on High-Performance Computing and National Information Infrastructure, Plymouth, NH, July 1997.

J. A. Kohl, P. M. Papadopoulos, "Fault-Tolerance and Reconfigurability Using CUMULVS," Oral Presentation, Cluster Computing Conference, Emory University, Atlanta, GA, March 9-11, 1997.

J. A. Kohl, "CUMULVS Software Demonstration," DOD CEWES MSRC Colloquium on HPC Collaborative Methods and Tools, Vicksburg, Mississippi, February 27-28, 1997.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, B. D. Semeraro, CUMULVS Demonstration, High-Performance Computing Challenge, Supercomputing 1996, Pittsburgh, PA, November 1996.

J. A. Kohl, "CUMULVS Demo: Interacting with Distributed, Online Simulations," Oral Presentation, Software Tools for High Performance Computing Systems, Chatham, MA, October 15-18, 1996.

K. D. Barnes, J. A. Kohl, "FaMOUS Design Overview," Oral Presentation, DOE Data Modeling Workshop, Gaithersburg, MD, June 17-19, 1996.

P. M. Papadopoulos, J. A. Kohl, "CUMULVS: an Infrastructure for Steering, Visualization and

Checkpointing for Parallel Applications," 1996 PVM User's Group Meeting, Santa Fe, NM.

J. A. Kohl, P. M. Papadopoulos, "The Design of CUMULVS: Philosophy and Implementation," 1996 PVM User's Group Meeting, Santa Fe, NM.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, W. A. Shelton, StovePipe Demonstration, High-Performance Computing Challenge, Supercomputing 1995, San Diego, CA, December 1995.

G. A. Geist, J. A. Kohl, R. Manchek, P. M. Papadopoulos, "New Features of PVM 3.4," 1995 Euro PVM User's Group Meeting, Lyon, France, September 1995.

Invited to Attend Gordon Research Conference on High-Performance Computing and National Information Infrastructure, Plymouth, NH, July 1995.

J. A. Kohl, G. A. Geist, "A New Tracing Facility for PVM 3.4," Oral Presentation, PVM Users Group Meeting, Pittsburgh, PA, May 8-9, 1995.

J. A. Kohl, G. A. Geist, "XPVM: A Graphical Console and Monitor for PVM," Invited Presentation, Los Alamos National Laboratory PVM Users Meeting, December 8, 1994.

J. A. Kohl, "Parallel Programming: Just Do It," Invited Presentation, POOMA Workshop (Parallel Object-Oriented Methods and Applications), Santa Fe, NM, December 5-7, 1994.

G. A. Geist, J. A. Kohl, P. M. Papadopoulos, J. Donato, PVMAVS Demonstration, Heterogeneous Computing Challenge, Supercomputing 1994, Washington, D.C., November 1994.

J. A. Kohl, T. L. Casavant, "The IMPROV Custom Animation Environment for Parallel Program Visualization," Oral Presentation, PTOOLS Parallel Tools Consortium, First General Meeting, NASA Ames Research Center, Moffett Field, CA, June 8-10, 1994.

J. A. Kohl, G. A. Geist, "XPVM: A Graphical Console and Monitor for PVM," Poster Presentation, The 1994 Scalable High Performance Computing Conference (SHPCC), Knoxville, TN, May 23-25, 1994.

J. A. Kohl, G. A. Geist, "XPVM: A Graphical Console and Monitor for PVM," Oral Presentation, PVM Users Group Meeting, Garden Plaza Hotel, Oak Ridge, TN, May 19-20, 1994.

J. A. Kohl, Invited XPVM Tool Demonstration and Oral Presentation, University of Tennessee PVM Class, Ruth Ann Manning - Instructor, Ayres Hall, Knoxville, TN, March 22, 1994.

J. A. Kohl, Invited XPVM Tool Demonstration, Engineering Open House, University of Kentucky, Electrical Engineering Department, Lexington, KY, February 26, 1994.

G. A. Geist, J. A. Kohl, XPVM Tool Demonstration, Heterogeneous Computing Challenge, Supercomputing 1993, Portland, Oregon, November 15-19, 1993.

J. A. Kohl, T. L. Casavant, "Methodologies for Rapid Prototyping of Tools for Visualizing the Performance of Parallel Systems," Presentation at Workshop on Parallel Computer Systems: Software Tools, Santa Fe, New Mexico, October 1991.

## Scholarships and Awards:

- Significant Event Award, CUMULVS Work for Supercomputing 1996, Oak Ridge National Laboratory, 1997.
- Silver Medal for Innovation, High-Performance Computing Challenge, Supercomputing 1996.
- Division Director's Award, Computer Science and Mathematics Division, Oak Ridge National Laboratory, 1995.
- Award for User Interface and Reliability, High-Performance Computing Challenge, Supercomputing 1995.
- Significant Event Award, FaMOUS Work, Oak Ridge National Laboratory, 1995.
- 2nd Place, Heterogeneous Computing Challenge, Supercomputing 1994.
- Most Elegant Interface, Heterogeneous Computing Challenge, Supercomputing 1993.
- University of Iowa Graduate School Dean's Fellowship, 1/90 to 6/93.
- Purdue University Graduate School Fellowship, 8/88 to 8/89.
- Fessenden-Trott Memorial Scholarship - Single Recipient, Three Years 8/85 to 8/88.
- Purdue University President's Honor Award, 1984-5.
- Mensa International Scholarship - Essay Contest, First Round Prize, 1984.

## Programming Language Experience:

Extensive experience with C Language, fluent in Tcl/Tk, HTML, CGI (Common Gateway Interface), Pascal, Fortran, Strand, Perl, Awk, Sed, Unix, Prolog, LISP, SAS, SQL and BASIC. Experience with several parallel languages and systems, including usage and internals of Parallel Virtual Machine (PVM), the C* Parallel Programming Language, Versions 5.0 and 6.0, for the Connection Machine (CM-2), Parasoft's Express Parallel Programming System, Encore Multimax Tasking and Threads Environments, Intel Hypercube messaging, and Alliant FX/8 Parallel Vector Fortran. Extensive experience with general graphical interfaces, including AVS module programming, the X Window System and the Sun Microsystem's Sunview Window System. Worked with several operating systems, including BSD Unix, Unix System V, IBM AIX, Linux and IBM VM/CMS, and programmed shell environments, including C Shell and Bourne Shell Scripts, and EXEC2. Experience with a variety of assembly languages, including 68000, 6809, 8080/8085, 6502, and IBM System 370.

## Activities and Organizations:

Institute of Electrical and Electronics Engineers (IEEE).
    –> IEEE Computer Society.
Association for Computing Machinery (ACM).
    –> ACM Special Interest Group Computer Architecture (SIGARCH).
    –> ACM Special Interest Group Software Engineering (SIGSOFT).
    –> ACM Special Interest Group Computer-Human Interfaces (SIGCHI).
Eta Kappa Nu National Electrical Engineering Honor Society.
Tau Beta Pi National Engineering Honorary.
Phi Kappa Phi Honor Society.
Phi Eta Sigma Honor Society – Vice President, 1984.
Order of the Engineer.
Mensa International.

### Referee:

JPDC '98 and '95 (Journal of Parallel and Distributed Computing).
Int'l Journal of Supercomputer Applications and High Performance Computing, 1998.
DOE SBIR Phase I '98 and '96 (Small Business Innovation Research).
HPCN Europe '97 (High-Performance Computing and Networking).
pAs '97 (Aizu International Symposium on Parallel Algorithm/Architecture Synthesis).
IPPS '94 - '97 (Int'l Parallel Processing Symposium).
Supercomputing '96 and '94.
HICSS-28 (Hawaii International Conference on System Sciences 1995).
ORNL Seed Money Proposal, 1994.
IEEE Computer, 1994 (selected as official reviewer for papers on software tools).
SHPCC '94 (Scalable High Performance Computing Conference).
FTCS-23 (Fault Tolerant Computing Systems).
IEEE Frontiers of Massively Parallel Computation, 1992.
IEEE COMPSAC, 1989, 1991, and 1992.

## Leadership Experience and Non-Technical Activities:

### Purdue University Band Department:

Member of Purdue University Campaign Advisory Board for the Purdue University Bands Capital Campaign "A Song Anew" - 1996 to Present.
Chief of Staff, Student Officer Corps - 2 Years, 1987 to 1988.
Drum Major, All-American Marching Band - 4 Years, 1985 to 1989.
Head of Personnel Office, Student Officer Corps - 4 Years, 1985 to 1989.
Saxophone Section Leader, American Music Review - 5 Years, 1984 to 1989.
Saxophone Section Leader, Symphony Band (1st Band) - 3 Years, 1986 to 1989.
Saxophone Section Leader, Boiler Brass Basketball Band - 2 Years, 1986 to 1988.
Saxophone Section Leader, Concert Band (2nd Band) - 1 Year, 1984.

### Special Activities & Performances:

1989 Presidential Inaugural Parade, Washington, D.C., All-American Marching Band
President Ronald Reagan Visit, Purdue 1988, American Music Review.
Performed on Caribbean Cruises, 4 Cruises (1984-1989), American Music Review.
Peach Bowl, All-American Marching Band - 1984.

### Naperville North High School:

Teaching Assistant, Jr. High Computer Programming Class, Dist 203 Summer School, 1983.
Teaching Assistant, IER (Institute for Educational Research) Computer Camp, 1982.
National Honor Society - 1984 (Ranked 16/520, GPA = 4.0833/4.0).
President of the Band Executive Committee - 1984.
Drum Major Marching Band - 3 Years, 1981 to 1984.
Saxophone Section Leader, Symphonic Band - 4 Years, 1980 to 1984.
Saxophone Section Leader, Jazz Band - 4 Years, 1980 to 1984.
Saxophone Section Leader, Basketball Pep Band - 3 Years, 1981 to 1984.
Pit Orchestra, Performances of "Guys and Dolls" and "Funny Girl".
Finalist in McDonald's All-American Band - 1984.
John Philip Sousa Award - 1984.

## References:

Philip M. Papadopoulos, Research Staff,
Distributed Computing Group, Distributed Intelligent Systems Section,
Computer Science and Mathematics Division,
Oak Ridge National Laboratory, Oak Ridge, TN 37831-6367.

Charles H. Romine,
Adjunct Associate Professor,
Department of Computer Science, University of Tennessee,
Scientific Computing User Advocate,
Research Staff, Computer Science and Mathematics Division,
Oak Ridge National Laboratory, Oak Ridge, TN 37831-6367.

Dr. J. J. Dongarra,
Distinguished Scientist,
Mathematical Sciences Section, Computer Science and Mathematics Division,
Oak Ridge National Laboratory,
Distinguished Professor of Computer Science,
University of Tennessee, Knoxville, TN, 37996.

### Alternate References:

G. A. Geist, II, Research Staff,
Group Leader, Distributed Computing Group, Distributed Intelligent Systems Section,
Computer Science and Mathematics Division,
Oak Ridge National Laboratory, Oak Ridge, TN 37831-6367.

Dr. T. L. Casavant, Associate Professor,
Department of Electrical and Computer Engineering,
University of Iowa, Iowa City, IA, 52242.

Dr. D. N. Kimelman, Research Staff,
IBM Thomas J. Watson Research Center,
Yorktown Heights, NY, 10598.

Dr. E. L. Lusk, Senior Computer Scientist,
Scientific Director, Advanced Computing Research Facility,
Mathematics and Computer Science Division,
Argonne National Laboratory, Argonne, IL, 60439.

Dr. H. W. Thompson, Jr., Assistant Chair,
School of Electrical Engineering,
Purdue University, West Lafayette, IN, 47907.

Robert J. McMahon, Manager of Computer Networking,
Electronics & Computing Technologies Division,
Argonne National Laboratory, Argonne, IL, 60439.