

John F. Karpovich

**2329 Whippoorwill Road
Charlottesville, VA 22901**

**Phone: (434) 978-1292
Email: jmdkarp@comcast.net**

Objective

Secure challenging and rewarding employment that takes advantage of my 15+ years of experience designing, implementing and deploying software systems and supporting application users.

Education

Masters of Computer Science

- University of Virginia, January 1995
- Graduated with 3.95/4.0 GPA

B.S. Economics, concentrations in Finance and Decision Sciences

- University of Pennsylvania, May 1988
- Graduated cum laude with 3.59/4.0 GPA.

Experience

October 2007 – present University of Virginia, Charlottesville, VA

Research Scientist

- Research Scientist for Data Pedigree Project under Dr. Alfred Weaver.
 - Data Pedigree is a project to develop techniques and associated software to enable data consumers to better understand the provenance and inter-relationships between separate pieces of data and to track when changes occur to critical pieces of information. Though funded by the Office of Naval Research via an SBIR Phase II contract, the project has many applications – for example, patient medical records, intelligence gathering, and business decision making, just to name a few.
 - Architected, designed and implemented the prototype Data Pedigree system using a Service-Oriented Architecture and a web-based front end. Responsible for full range of development activities, including design, implementation, source control, and demonstration of the prototype system. System implemented using Microsoft ASP .Net, C#, Web services (including MS Web Services Enhancements), MS SQL Server 2005, and Adobe Flash/Action Script 3.0.
 - Responsible for deploying and demonstrating test system.
 - Responsible for technical presentations to sponsor.

May 2005 – October 2007 University of Virginia, Charlottesville, VA

Research Scientist and Communication Director

- Research Scientist with Virginia Center for Grid Research under Dr. Andrew Grimshaw.
 - Designed/implemented core components of Genesis II Grid software (Java, Apache Axis, Jetty)
 - Responsible for deployment and maintenance of Global Bio Grid and UVa Campus-wide grid.
 - Implemented improvements to Legion grid software (C++).
 - Responsible for writing and preparing external funding proposals (e.g. NSF, DoD).
 - Collaborated with Keck Biomedical Mass Spectrometry Lab to improve their data and computation workflow, including the development of a web-based prototype Proteomics Workbench (Perl).
 - Collaborated with researchers in the Statistical Bioinformatics Group to run high throughput computations (~250,000 jobs) to study the relationships between cancer patient gene expression and outcomes in order to promote anticancer gene-drug discovery (Perl, PBS, Unix scripting).

- Communications Director for Virginia Center for Grid Research
 - Coordinate partnership with UVA's Information Technology & Communication department for Campus-wide Grid project.
 - Designed, produced, and maintain Virginia Center for Grid Research web page and other external information media.
 - Prepare funding status reports.

February 2004 – May 2005

ScholarOne, Charlottesville, VA

Senior Developer/Architect

- Senior software developer/architect for ScholarOne's ManuscriptCentral product. ManuscriptCentral is a web-based document submission and peer review product written in Java, JSP, Servlets, JDBC, and XML using WebLogic, DB2 and AFS.
 - Designed/developed variety of new features for product.
 - Improved product performance via code redesign, data caching and SQL query optimization. Optimized memory usage and tuned garbage collection settings.
 - Debugged various defects ranging from logic errors to synchronization problems.
 - Designed architectural options to improve product availability with the goal of 99.9+% availability.
 - Designed email subsystem for all ScholarOne products to improve ability to handle spam blockers and provide better email auditing.
 - Co-designed new options to improve system scalability and ability to support multiple code bases.

August 2001 - August 2003

Avaki Corporation, Charlottesville, VA

Senior Architect

- Senior software architect for Avaki's grid computing product. Avaki's grid computing product was based on Legion software, and work on this product at Avaki focused on productizing it and improving its robustness and usability. As the senior architect, Mr. Karpovich was responsible for overall system design, training others in its implementation, implementing and testing new or improved features and trouble shooting.
 - Implemented a communication proxy (UDP/IP & C/C++) to enable grid computing product to span firewalls, Network Address Translators (NATs), and across Virtual Private Networks (VPNs).
 - Implemented improvements to core components of the system, including improved object instantiation, placement, and scheduling.
 - Co-implemented new automated testing harness to improve system reliability (mostly using C++ modules and shell scripts).
 - Trained other developers and services staff members on various system components and how to identify and handle various client networking environments.
 - Represented company as technical expert during sales meetings with clients.
 - Collaborated with services staff to review client computing and networking environments to help plan for demonstrations and deployments.
 - Worked closely with technical writing staff to develop professional grade user and administrative manuals.
 - Lead a team of contract employees to take over maintenance of the grid computing product.
- Senior architect on Avaki's enterprise data management and integration product. This product focused exclusively on distributed data and user management. Its implementation was based on Java/J2EE and the JBOSS application server suite. Mr. Karpovich's responsibilities on this product included the design, implementation, and testing of various system components.
 - Designed and implemented an internal event/notification mechanism using Enterprise JavaBeans and JMS (JBOSSMQ). Tested this subsystem and created automated stress tests using JUNIT.

- Implemented system upgrade functionality and established a coding framework for future upgrades.
- Actively engaged in the grid community and standards bodies, including being an active member of the Global Grid Forum (GGF) and the Open Grid Services Infrastructure and Architecture (OGSI/A) working groups.

June 1997 - August 2001

University of Virginia, Charlottesville, VA

Senior Research Scientist

- Co-designed, implemented, performance tuned, tested, and maintained the Legion grid computing system. Legion is a secure, high performance, wide-area distributed and parallel computing and remote data sharing platform. Substantial personal design and/or implementation impact on overall system architecture and object model, object naming and lookup components, inter-object communication system, resource management components, object placement framework, object information model, object instantiation and management system.
 - Coding of Legion was primarily in C/C++, with additional coding in shell scripting languages, and limited FORTRAN and Perl. Coding included development/maintenance of inter-process communication layer using UDP/IP socket-level programming, development of a security infrastructure using PKI libraries, development of object naming, binding and management and other services using C++, resource and process management using native OS facilities.
 - Development included work on most major UNIX systems as well as Windows NT.
- Developed technical presentations and delivered them to conference audiences, partner personnel and individual clients.
- Developed training materials and taught training workshops and individual sessions at UVa and at partner and client sites.
- Helped to deploy and maintain large continuously running grid systems, some containing more than a dozen distributed partner organizations.
- Helped partners and clients to deploy Legion software either to form their own grid systems or to join existing grids. Also helped clients to tailor their systems to their needs.
- Helped end users to deploy their computations and data to run in a Legion grid environment. This included instruction and help on performing any necessary structural or porting changes to their code to enable them to best take advantage of a grid system.
- Helped to write grant proposals to fund the development of Legion and authored or co-authored numerous peer reviewed technical and experience papers on various aspects of the Legion system.
- Actively engaged in distributed and grid computing community and standards bodies. Co-chairman of GGF Remote Data Access Group and active GGF member.

January 1992 - May 1997

University of Virginia, Charlottesville, VA

Research Assistant/Teaching Assistant

- Worked under Dr. Andrew Grimshaw on distributed and grid systems, particularly the design and development of Legion and the Mentat parallel computing system.
- Researched methods to improve I/O performance at the National Radio Astronomy Observatory. Designed, developed and performance tested a prototype I/O system for astronomy data.
- Assisted teaching undergraduate computer architecture course. Developed and presented lectures, graded student work and tutored.
- Worked under Dr. Tom Olson on computer vision projects, primarily on a graphical flow-based image processing system.

August 1988 - August 1991

American Mgmt. Systems, Inc., Arlington, VA

Information Systems Consultant

- Consultant on various system development and information resource management projects with private and government clients.
- Database team leader on two major software development contracts with insurance companies. Responsibilities included: requirements analysis, design, implementation, and performance analysis of database sub-systems for life insurance underwriting systems (using DB2); coordination and scheduling of team member activities; coordination of database team activities within large project; coordination and collaboration with client database and project management team members.
- Developed an Oracle-based system to improve analysis and report generating ability of clients at the Department of Agriculture's Commodity Credit Corporation. Responsibilities included: working with clients to determine requirements; choosing the proper software to meet their needs; designing and implementing a prototype system using PC Oracle DBMS and Oracle forms; demonstrating the prototype to clients and training clients in its use.

Programming Experience

ASP .Net, C#, Microsoft WSE, ActionScript 3.0, C/C++/VC++, Java, J2EE, JMS (JBOSSMQ), JBOSS, Perl, XML, JUNIT, Message Passing Interface (MPI), Parallel Virtual Machine (PVM), Unix scripting, SQL & Relational DBMS (Oracle, DB2, Cloudscape, HSQLDB, PostGres, SQL Server 2005), TCP/IP & UDP/IP networking, CVS and Subversion software management systems.

Publications

A Strategy for Predicting the Chemosensitivity of Human Cancers and its Application to Drug Discovery

Jae K. Lee, Dmytro M. Havaleshko, HyungJun Cho, John N. Weinstein, Eric P. Kaldjian, John Karpovich, Andrew Grimshaw, and Dan Theodorescu, *Proceedings of the National Academy of Sciences*, Vol. 104, No. 32, pp 13086-13091, August 2007.

Architectural Support for Flexibility and Autonomy in Wide-Area Distributed Object Systems

M. J. Lewis, A. J. Ferrari, M. A. Humphrey, J. F. Karpovich, M. M. Morgan, A. Natrajan, A. Nguyen-Tuong, G. S. Wasson, and A. S. Grimshaw, *Journal of Parallel and Distributed Computing* (2003)

Book Chapter: From Legion to Avaki: The Persistence of Vision

A.S. Grimshaw, A. Natrajan, M. Humphrey, M. J. Lewis, A. Nguyen-Tuong, J. F. Karpovich, M. M. Morgan, A. J. Ferarri, *Grid Computing: Making the Global Infrastructure a Reality*, eds. Fran Berman, et al, November 2002.

Resource Management in Legion

S. J. Chapin, D. Katramatos, J. F. Karpovich, A. S. Grimshaw, *Future Generation Computer Systems* 15 (5-6) pp. 583-594 (1999), Special Issue on Metacomputing, Elsevier.

The Legion Resource Management System

S. J. Chapin, D. Katramatos, J. F. Karpovich, *5th IPPS Workshop on Job Scheduling Strategies for Parallel Processing*, San Juan, Puerto Rico, pp. 105-114 (April 1999).

Fault-Tolerance via Replication in Coarse Grain Data Flow

A. Nguyen-Tuong, A. S. Grimshaw, J. F. Karpovich, Springer Verlag, 1995.

Extensible File Systems (ELFS): An Object-Oriented Approach to High Performance File I/O

J. F. Karpovich, A. S. Grimshaw, J. C. French, *Proceedings of the 9th Annual Conference on Object-Oriented Programming Systems, Languages, and Applications*, Portland, OR, pp. 191-204, Oct. 1994.

High Performance Access to Radio Astronomy Data: A Case Study

J. F. Karpovich, J. C. French, A. S. Grimshaw, *Proceedings of the Seventh Working Conference on Scientific and Statistical Database Management*, Charlottesville, VA, pp. 240-249, September 1994.

A Parallel Object-Oriented Framework for Stencil Algorithms

J. F. Karpovich, M. Judd, W. T. Strayer, A. S. Grimshaw, *Proceedings of the Second International Symposium on High Performance Distributed Computing (HPDC)*, Spokane, WA, pp. 34-41, July 1993.

Support for Object Placement in Wide Area Heterogeneous Distributed Systems

J. F. Karpovich, Dissertation Proposal, University of Virginia Computer Science Department Technical Report CS-96-03, January 1996.

Professional Affiliations & Service

Co-chair Remote Data Access Working Group of GGF, 2000-2001

Member Open Grid Services Infrastructure/Architecture (OGSI)/A working group of GGF, 2002-2003.

University of Virginia Computer Science Department Infrastructure Committee, 1995-1997

Paper refereeing for: *Topics in Parallel and Distributed Computing; Heterogeneous Computing Workshop; Concurrency: Practice and Experience; Conference on Scientific and Statistical Database Management*

Awards

NASA GSRP Fellowship, 1993-1996

High Performance Computing Challenge Award, Supercomputing 1995

Outstanding Teaching Assistant, 1992

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