

PATRICIA E. GILFEATHER

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EDUCATION

Ph.D., Computer Science, University of New Mexico, Albuquerque, NM Expected May 2005
Dissertation - Using Techniques of Commodity Operating Systems to Increase
Performance of TCP in High-Performance Computing. Advisor: Dr. Arthur B. Maccabe.

Masters of Science, Computer Science, University of New Mexico, Albuquerque, NM December 1996
Advisor: Dr. George Luger.

Bachelor of Arts, Literature, Duke University, Durham, NC May 1990
Eight courses toward degree in Mathematics including independent work in fuzzy logic.

PROFESSIONAL AND RESEARCH EXPERIENCE

University of New Mexico Albuquerque, NM
Los Alamos Computer Science Institute, Research Assistant September 2000 - present

- Developed method of splintering protocols to improve performance. Splintering moves part of the functionality from the operating system.
- Successfully splintered IP by moving fragmentation and reassembly to the network interface card (NIC) and decreased overhead by 40%.
- Designed a model for determining how to best splinter protocols and where to move functionality.
- Created a method for deactivating and reactivating TCP connections that decreased space usage for sockets by ten-fold which facilitates TCP scaling and splintering onto the network interface card.

Sandia National Laboratories Albuquerque, NM
University of New Mexico, Research Assistant August 1999 - September 2000

- As part of a group using agent-based reasoning to create secure networks, developed adaptive firewalling code using CLOS to manipulate Linux IPChain rules in the event of a potential flood.

Omneon Video Networks Portland, OR
Design Engineer July 1998 - July 1999

- As part of a start-up company that is creating a IEEE 1394b switch to accommodate scaling in multi-media infrastructure for the broadcast industry, created a real-time VideoDisk Controller for testing.
- Helped design the videodisk recorder file system including work on design of the Object Cache Coherence protocol and locking mechanisms for shared file system.

Intel Corporation Jones Farm, Hillsboro, OR
Software Engineer, QuickWeb Technology Group February 1997 - July 1998

- As part of a team that productized a modular Internet proxy server, redesigned and implemented User Management module. The new module included automated fallback/fallforward mechanisms for both the proxy and database and increased speed of a single HTTP call by 300%.
- Architect of the Log Center project which included proprietary logging and archiving of Internet proxy servers and databases; automated retrieval of archives from geographically distributed systems; and automated data mining, generation and distribution of reports for various customers.
- Drove determination of performance bottlenecks in the persistent HTTP implementation. Redesign resulted in a product 2x faster than original persistent HTTP design.
- Created an HTTP 1.0 compliance tester. Tester included HTTP client and HTTP server stub and could test correctness at single HTTP request level as well as at session level (including cache coherence).

Univ. of New Mexico High Performance Computing Ed. And Research Ctr.
DARPA contract - Research Assistant

Albuquerque, NM
November 1995 - December 1996

- Parallelized and optimized performance of computational fluid dynamics and general non-linear system solution code using MPI on the IBM SP1 and SP2.
- Created test suites to research performance and usability of parallel libraries for solving sparse systems of linear equations (banded and skyline matrices).

Sandia National Laboratories
University of New Mexico - Research Assistant

Albuquerque, NM
May 1995 - November 1995

- As part of a team developing a successful prototype of a client/server system for Life Cycle Analysis for manufacturing, was solely responsible for the development of the LCA client prototype. Client was Internet server and LCA client. It translated LCA protocol, resolved unknown information by polling other servers, and generated appropriate user interface information on the fly.
- Specified and developed an automated CLOS to HTML interpreter.

PUBLICATIONS

- 'Making Commodity Protocols Viable for High-Performance Computing' (poster), Patricia Gilfeather, DoE High Performance Computing Conference, Salishan, OR, April 23-29, 2004 (invited).
- 'Splintering TCP for High-Performance Computing' (poster), Patricia Gilfeather, Los Alamos Computer Science Institute, Santa Fe, NM, October 27-29, 2003.
- 'Splintering TCP', Patricia Gilfeather & Arthur Maccabe, Proceedings of the 17th International Symposium on Computer and Information Sciences, Orlando, FL, October 29-30, 2002 (invited).
- 'Making TCP Viable as a High Performance Computing Protocol', Patricia Gilfeather & Arthur Maccabe, Proceedings of the 3rd Annual Symposium of the Los Alamos Computer Science Institute (LACSI 2002), Santa Fe, New Mexico, October 13-16, 2002.
- 'Increasing Performance in Commodity TCP/IP', Patricia Gilfeather & Arthur Maccabe & Todd Underwood, Proceedings of the 4th Grace Hopper Celebration of Women in Computing Vancouver, British Columbia, Canada, October 9-12, 2002.
- 'Fragmentation and High-Performance IP', Patricia Gilfeather & Todd Underwood, Proceedings of the 15th International Parallel & Distributed Processing Symposium (IPDPS-01), San Francisco, CA, April 23-27, 2001.

TEACHING EXPERIENCE

Advanced Networks, guest lecturer and grader

Fall, 2004

- Developed and presented lectures on network middleware, multi-media applications and protocols and overlay networks.
- Graded papers.

Assistant Advisor, undergraduate honors thesis student

Spring, 2003

- Advised during all stages of thesis from proposal creation through test development and data analysis to final thesis.

Introduction to Non-Imperative Programming Languages, Instructor-of-record

Spring, 2001

- Developed curriculum and lectures.
- Chose class material.
- Created and graded class exams and projects.
- Held office hours.
- Supervised teaching assistant.

SERVICE

Student Representative to Computer Science Hiring Committee

Spring, 2003