

PHILIP C. ROTH

Curriculum Vitae

Future Technologies Group
Computer Science and Mathematics Division
Oak Ridge National Laboratory
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EDUCATION

- Ph.D. in Computer Science, University of Wisconsin, Madison, WI, 2005. Thesis titled “Scalable On-line Automated Performance Diagnosis,” supervised by Prof. Barton P. Miller. Minor in Business. GPA 3.9/4.
- M.S. in Computer Science, University of Illinois at Urbana-Champaign, Urbana, IL, 1996. Thesis titled “ETRUSCA: Event Trace Reduction Using Statistical Data Clustering Analysis,” supervised by Prof. Daniel A. Reed. GPA 4.9/5.
- B.S. in Computer Science and Mathematics with highest distinction, University of Iowa, Iowa City, IA, 1992. GPA 4.0/4.

EXPERIENCE

- Research and Development Staff (2007–present)/Research and Development Associate (2004–2007), Future Technologies Group, Oak Ridge National Laboratory (ORNL). Investigating techniques for petascale tools, performance modeling and simulation as principal investigator on ORNL Lab Director’s Research and Development fund project and as part of ORNL team on U.S. Department of Energy Scientific Discovery through Advanced Computing (SciDAC) Performance Engineering Research Institute project. Investigating petascale data storage problems as ORNL point of contact for SciDAC Petascale Data Storage Institute project.
- Research Assistant, Paradyn Project, University of Wisconsin, 1998–2004. Focused on improving the scalability of automated performance diagnosis. Developed and evaluated the Distributed Performance Consultant, an on-line automated approach for performance diagnosis on thousands of processes. Part of team that developed and evaluated MRNet scalable tool infrastructure. Developed and evaluated MRNet-based scalable performance diagnosis and performance diagnosis results visualization techniques.
- Software Developer, MCSB Technology (formerly known as CHEN Systems Corp.), 1994–1998. Developed UnixWare and Windows system administration tools for award-winning CHEN 1000 server system.
- Research Assistant, Pablo Project, University of Illinois at Urbana-Champaign, 1992–1994. Developed method of reducing event trace data volume using statistical data clustering. Developed new user interface components for the Pablo performance tool.
- Teaching Assistant, Department of Computer Science, University of Illinois at Urbana-Champaign, 1992. Taught all discussion sections of introductory computer science course for non-technical majors.
- Teaching Assistant, Department of Electrical and Computer Engineering, University of Iowa, 1991–1992. Led three lab sessions of a course on hardware device control using assembly language programs.
- Undergraduate Research Assistant, ECE Parallel Processing Laboratory, University of Iowa, 1990–1992. Assisted in development of timed Petri net simulation tool.
- Undergraduate Research Assistant, Physics Department, University of Iowa, 1988–1990. Assisted in deployment of high energy particle detector at Fermi National Accelerator Laboratory, Summer 1990.

SELECTED PUBLICATIONS

- S.R. Alam, R.F. Barrett, M.R. Fahey, J.A. Kuehn, O.E.B. Messer, R.T. Mills, P.C. Roth, J.S. Vetter, and P.H. Worley, "An Evaluation of the ORNL Cray XT3," *International Journal of High Performance Computing Applications*, 2007, (to appear).
- P.C. Roth and J.S. Vetter, "Intel Woodcrest: An Evaluation for Scientific Computing," *Eighth LCI International Conference on High-Performance Clustered Computing*, South Lake Tahoe, May 2007, (to appear).
- S.R. Alam, R.F. Barrett, J.A. Kuehn, P.C. Roth, and J.S. Vetter, "Characterization of Scientific Workloads on Systems with Multi-Core Processors," *2006 IEEE International Symposium on Workload Characterization*, San Jose, CA, October 2006.
- S.R. Alam, R.F. Barrett, C.B. McCurdy, P.C. Roth, and J.S. Vetter, "Characterizing Applications on the MTA-2 Multithreading Architecture," *Cray User Group 2006 annual technical meeting (CUG 2006)*, Lugano, Switzerland, May 2006.
- P.C. Roth and B.P. Miller, "On-line Automated Performance Diagnosis on Thousands of Processes," *Proc. ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP'06)*, New York City, March 2006.
- J.S. Vetter, N. Bhatia, E.M. Grobelny, and P.C. Roth, "Capturing Petascale Application Characteristics with the Sequoia Toolkit," *Proc. Parallel Computing 2005 (ParCo 2005)*, Málaga, Spain, September 2005.
- P. Worley, J. Candy, L. Carrington, K. Huck, T. Kaiser, G. Mahinthakumar, A. Malony, D. Reed, P. Roth, S. Shan, S. Shende, A. Snively, S. Sreepathi, and Y. Zhang, "Performance Analysis of GYRO: A Tool Evaluation," *Journal of Physics: Conference Series* **16**(2005), pp. 251–255.
- P.C. Roth, D.C. Arnold, and B.P. Miller, "Benchmarking the MRNet Distributed Tool Infrastructure: Lessons Learned," *Proc. High-Performance Grid Computing Workshop*, held in conjunction with the *2004 International Parallel and Distributed Processing Symposium (IPDPS 2004)*, Santa Fe, New Mexico, April 2004.
- P.C. Roth, D.C. Arnold, and B.P. Miller, "MRNet: A Software-Based Multicast/Reduction Network for Scalable Tools," *SC 2003*, Phoenix, Arizona, November 2003.
- P.C. Roth and B.P. Miller, "Deep Start: A Hybrid Strategy for Automated Performance Problem Searches," *Concurrency and Computation: Practice and Experience* **15**(11–12), R. Feldman and B. Monien (Eds.), September 2003, John Wiley & Sons, Inc., Hoboken, New Jersey, pp. 1027–1046.
- O.Y. Nickolayev, P.C. Roth, and D.A. Reed, "Real-Time Clustering for Event Trace Reduction," *Third Workshop on Environments and Tools for Parallel Scientific Computing*, Lyon, France, August 1996. Appears in *Intl. Journal of Supercomputing Applications and High Performance Computing* **11**(2), Summer 1997, pp. 144–159.
- D.A. Reed, R.A. Aydt, R.J. Noe, P.C. Roth, K.A. Shields, B. Schwartz, and L.F. Tavera, "Scalable Performance Analysis: The Pablo Performance Analysis Environment," *The Scalable Parallel Libraries Conference*, Starkville, MS, October 1993, A. Skjellum and D.S. Reese (Eds.), IEEE Computer Society Press, Los Alamitos, California, pp. 104–113.

AWARDS AND HONORS

- Best Student Paper Award nominee, SC2003.
- University of Wisconsin, Madison Graduate Student Council Vilas Travel Fellowship, 2003.
- Honorable Mention, National Science Foundation Graduate Fellowship, 1992–1993.
- Barry M. Goldwater Scholarship winner, 1990–1992.
- University of Iowa Ernest R. Johnson Memorial Prize (awarded to College of Liberal Arts graduates with the highest and second highest GPA), 1992.
- National Merit Scholar (sponsored by the University of Iowa), 1988–1992.
- Phi Beta Kappa.

PROFESSIONAL ACTIVITIES

Committee Membership:

International Conference on Parallel Processing (ICPP-2007)
High Performance Computation Conference (HPCC-2007)
8th International LCI Conference on Clustered Computing (2007)
SC06 Technical Paper Committee
2nd International Conference on High Performance Computing and Communications (HPCC-06)
SC05 Poster Committee

Reviewer:

SC07
31st Annual International Symposium on Computer Architecture (ISCA 2004)
SC 2003
15th Symposium on Computer Architecture and High Performance Computing (SBAC-PAD2003)
12th IEEE International Symposium on High-Performance Distributed Computing (HPDC-12)
9th European PVM/MPI Users' Group Meeting (EuroPVM/MPI-2002)
8th International Euro-Par Conference (EuroPar 2002).
Parallel and Distributed Computing Practices (journal, 2001).

Member of IEEE Computer Society, ACM, ACM SIGMETRICS, and ACM SIGOPS.

REFERENCES

Prof. Barton P. Miller
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