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PROFILE

I have over 20 years experience in the areas of parallel and distributed computing. Parallelism can be used to solve problems faster, to solve larger problems or to solve problems more accurately. In parallel computing my main interests are in parallel algorithms, software and the performance characteristics of high-speed computer networks. I have worked on middleware to support message-passing parallel processing, in particular with regards to commodity networks using standardized transport protocols. In the last 20 years I have help to develop algorithms and systems in several application areas but most recently my interests has been data and compute intensive applications associated with data mining and computational finance.

EXPERIENCE

Associate Professor, Department of Computer Science, UBC **1987-present**

I joined the Department of Computer Science at UBC after graduation from the University of Toronto. I am a tenured, Associate Professor involved in both teaching and research. I have published over 50 papers in the areas of parallel distributed computing, supervised over 20 MSc projects, and graduated 2 PhD students under my supervision.

Distributed Systems Architect, Terabeam Corporation, Seattle, Washington 2000-2001

Terabeam Corporation was a free space optical networking company that was started in the late nineties. I was a member of the Distributed Systems group who designed system software for the management and deployment of metropolitan area networks. Terabeam has undergone several mergers with other wireless providers.

Co-founder and CFO of Scalable Analytics, Vancouver **2007-2009**

Scalable Analytics is a UBC spin-off company developing high-performance computer systems and software tools for the financial industry. The company has developed a platform for analyzing massive amounts of online/streaming data in real-time. The technology has numerous applications in the financial industry as well as many other vertical markets.

EDUCATION

Ph.D. (1987) University of Toronto, Department of Computer Science
M.Sc. (1983) University of Alberta, Department of Computer Science
B.Ed. (1978) Dalhousie University, Education Department
B.Sc Hons (1977) Dalhousie University, Mathematics Department

PUBLICATIONS (LAST 6 YEARS)

A. Refereed Journal Publications

1. Chilson, J., Ng R., **Wagner, A.**, and Zamar, R., "Parallel Computation of High Dimen sional Correlation and Covariance Matrices'', Algorithmica, Special Issue on Coarse Grain Computation, Springer New York, Vol. 45, No. 3, pp. 403-431, 2006
2. Brodsky A., Pedersen J., and **Wagner A.**, ``On the complexity of buffer allocation in message passing systems'', Journal of Parallel Distributed Computing, Vol. 65, pp. 692-713, Elsevier Press, 2005.

B. Other Refereed Publications

1. Penoff B., **Wagner A.**, Tuxuen M., Rungeler I., "MPI-NeTSim: "A network simulation module for MPI", Fifteenth International Conference on Parallel and Distributed Systems -- ICPADS 2009 (to appear [acceptance rate 91 out of 305 submissions].
2. **Wagner A.**, and Rostoker C., "A Lightweight Stream-processing Library using MPI", 14th International Workshop on High-Level Parallel Programming Models and Supportive Environments, IPDPS, Rome, April 2009.
3. Wang J., Rostoker C., and **Wagner A.**, "A High Performance Pair Trading Application", 2nd Intl. Workshop on Parallel and Distributed Computing in Finance, IPDPS 2009 Rome, April 2009.
4. Tsai M., Penoff B., **Wagner A**., "A Hybrid MPI Design using SCTP and iWARP", 8th Communication Architectures for Clusters Workshop, CAC 2008, Int'l. Parallel and Distributed Processing Symposium (IPDPS), March, Miami 2008
5. Penoff B., Tsai M., Iyengar J., and **Wagner A.**, "Using CMT in SCTP-based MPI to exploit multiple interfaces in cluster nodes", Recent Advances in Parallel Virtual Machine and Message Passing Interface, LNCS 4757, 14th Euro. PVM/MPI Users' Group Meeting, Pg. 204-212., May 2008.
6. Rostoker C., **Wagner A.**, and Hoos H., "A parallel workflow for real-time correlation and clustering of high-frequency stock market data". Proc. of the 2007 IEEE International Parallel and Distributed Processing Symposium (IPDPS), Long Beach, California, March 2007. (8 pages). [acceptance rate 26% (109 papers accepted out of 419 submissions), committee]
7. Penoff B., and **Wagner A.**, "Towards MPI progression layer elimination with TCP and SCTP". In workshop on High-Level Parallel Programming Models and Suppor-

tive Environments (HIPS): Proc. of the 2006 IEEE International Parallel and Distributed Processing Symposium (IPDPS), Rhodes, Greece, April 2006. (8 pages).

8. Humaira K., Penoff B., Tsai M., Vong E., and **Wagner A.**, "Using SCTP to hide latency in MPI programs'". In Heterogeneous Computing Workshop (HCW): Proceedings of the 2006 IEEE Intl. Parallel and Distributed Processing Symposium (IPDPS), Rhodes, Greece, April 2006. (13 pages)
9. Kamal H., Penoff B., **Wagner A.**, "SCTP versus TCP for MPI" ACM/IEEE Supercomputing 2005 (SC2005), Seattle, November 2005 [62 out of 248 submissions accepted].
10. Kamal H., Penoff B., **Wagner A.**, "SCTP-based Middleware for MPI in Wide-Area Networks" 3rd Annual Conference on Communication Networks and Services Research (CNSR2005) sponsored by IEEE Computer Society's Technical Committee on Computer Communications (TCCC), May 2005. [accepted as a regular paper]
11. Kamal H., Penoff B., **Wagner A.**, "Evaluating transport level protocols for MPI in the Internet" Int'l Conf. on Communications in Computing CIC'2005, Las Vegas, June 2005. [regular research paper]
12. Chilson J., Ng R., **Wagner A.** and Zamar, R., "Parallel Computation of High Dimensional Robust Correlation and Covariance Matrices", ACM International Conference on Knowledge Discovery and Data Mining, (ACM KDD), poster paper August 2004. [acceptance rate 25%, 40 full papers, 45 poster papers out of 337 submissions]

D. Non Referred Publications and Presentations

1. Wang J., C. Rostoker C., Hoos H., **Wagner A.**, "Pairs trading with robust correlation", Industrial Applications of Mathematics session of PRIMA, Sydney Australia, July 2009.
2. Chilson J., Ng R., **Wagner A.** and Zamar, R., "Parallel Computation of Robust Covariance Matrices", research presentation, MITACS (Mathematics of Information Technology and Complex systems NCE) Quebec Interchange, Montréal, November 13, 2003.

E. Contribution to Practical Applications of Knowledge

1. Patent: Link Quality Agent, US Patent 6,678,251, issued January 13, 2004, Inventors: Sowizral, Henry Adam; Payne, Christopher Robin; Angus, Ian Gareth; **Wagner, Alan Shelton**; Harris, Patrick Neal; Hollinger, Kermit Andreas.

2. Software: (a) SCTP-based channel (CH3) for MPICH (October 06). In collaboration with Wm. Gropp's MPI group at Argonne, we have contributed software to allow SCTP to be used for MPI programs. Our software is now a standard part of the MPICH release and contained in all downloads of MPICH from Argonne National Labs. (b) SCTP BTL module for Open MPI. In collaboration with the Open MPI consortium we have contributed two modules to support one-to-one and many-to-one SCTP communication in Open MPI. Our modules are part of the repository and targeted for the next release of Open MPI. MPICH and Open MPI are two of the most widely used open source versions of MPI. MPI is the de-facto standard for parallel programming in High Performance Computing and is used in the vast majority of parallel Scientific code.

RECENT GRANTS

1. CFI "Leaders Opportunity Fund" grant ($240,000, PI N. Hutchinson, W. Aiello, **A. Wagne**r) which together with matching funding provides for the purchase of a 20 blade 10Ge test-bed system that is an ideal experimental platform for the research in this proposal. (2009)

2. NSERC I2I Grant ($120,995, PI **A. Wagner**, co PI H. Hoos), "Market Miner System" awarded April 10th, 2008. The Idea to Innovation grant is to support pre-commercialization activities. The UBC spinoff company Scalable Analytics was created from this work. (2008)

3. Cisco Collaborative Research Initiative ($50,000US, PI **A. Wagner**), "User-Level SCTP stack". Support for our work on porting the KAME SCTP stack to user-space. This was funded after our successful conclusion of a previous Cisco University Research Grant from Cisco ($62,000US). (2007, 2008)

PROFESSIONAL ACTIVITIES

Program committee for BC-NET's 2008 annual advanced networking conference. Adjudication committee for the "Bandwidth Challenge Contest", organized the student poster contest. Chair of BC-NET's Network Research Advisory Committee (NRAC). This committee meets regularly and its mandate is to support network research in BC. I am a member of HPCBC, the High Performance Computing in British Columbia group which meets to discuss the needs for high performance computing.