Wenguang Wang

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Research Interests

Design and performance evaluation of operating systems, storage and file systems, database systems, and distributed systems, with particular emphasis on storage system support for large scale systems.

Professional Experience

(1) Software Engineer, Local File System Team, CoreOS, Apple Inc.   09/2004–present
- Investigated performance and stability problems of ZFS port on Mac OS X
- Architected, designed, and implemented part of the next generation local file system for Mac OS X
- Designed and mathematically proved a space-efficient probabilistic set comparison algorithm which is being filed as a patent
- Architected, designed, and implemented the UDF (Universal Disk Format) file system driver from scratch for Mac OS X
- Actively involved in the OSTA UDF standard committee activities by proposing various proposals and weighing in on others
- Investigated performance issues of running file systems on flash media
- Investigated and enhanced a disk I/O priority algorithm and API for Mac OS X

(2) Research Assistant, Department of Computer Science, Univ. of Saskatchewan   12/1998–08/2004
Worked towards doctoral dissertation on the performance modeling and evaluation of:
- Storage management in DBMS
- Disk layout management for large scale systems
- Buffer cache replacement algorithms for large scale systems
- Large scale e-commerce systems

(3) Lecturer, Department of Computer Science, Univ. of Saskatchewan   01/2001–06/2002
Taught the following six undergraduate courses:
- 4th year courses: *Principles of Operating Systems* and *Computer Networks*
- 2nd year courses: *Computer Organization and Architecture* and *Data Structures and Object-Oriented Design*
- 1st year courses: *Data Structures in Java* and *Data Structures in C++*

(4) Visiting Research Scholar, IBM Toronto Lab, Canada   05/2001
- Implemented a fast tracing package for DB2 7.2 for Windows
- Collected buffer pool traces for TPC-C and TPC-D workloads

(5) Visiting Research Scholar, IBM Toronto Lab, Canada   05–09/2000
- Improved I/O efficiency of buffer management for DB2 7.1 for Windows
- Designed and implemented a self-tuning algorithm to manage disk I/Os in DB2 7.1 for Windows

(6) Visiting Research Scholar, IBM Toronto Lab, Canada   05–08/1999
- Studied DB2 storage management algorithms
- Developed and validated a detailed DB2 storage management system simulator
- Implemented a customized tracing package for DB2 6.1 for Windows
- Collected buffer pool traces

(7) Research Assistant, Institute of Computing Technology, China   09/1995–07/1998
Played important roles in the following Computer Supported Cooperative Work (CSCW) projects:
- Led the integration and the testing stages in the Integrated Business CAD (IBCAD) project
- Designed and implemented distributed communication service libraries for the following systems:
  - IBCAD
  - A distributed system supporting cooperative CAD design
  - A distributed conferencing system supporting real-time audio, chatting, and whiteboard
  - A distributed text editor allowing multiple people to edit the same file in real-time

- Designed and implemented a distributed architecture supporting the integration of client/server applications
- Designed an ODBC Driver for an Engineering DBMS with hierarchical-network data model
- Designed and implemented a prototype Virtual Meeting System using Lotus Notes

(8) Software Engineer, Shandong University, China   07/1994–08/1995

Led, designed and developed the following database application systems:
- A Human Resources management system for the Shipping Bureau of Shandong, China
- A management information system for the Continuous Education Center of Shandong, China
- A product management system for the Jinan Jinghua Jewelry Corporation of Shandong, China

Because of the flexibility and the versatility of my design, some modules developed in these systems were also used in several other systems developed by the Department of Computer Science, Shandong University

Education

Ph.D. in Computer Science	Department of Computer Science University of Saskatchewan, Canada Overall GPA: **91.4%** Supervisor: Professor Rick Bunt Thesis: Storage Management in Large Scale Systems	01/1999–12/2004
M.Sc. in Computer Science	Institute of Computing Technology Chinese Academy of Sciences, China Overall GPA: **90.0%**, GPA of Computer Science Courses: **90.6%** GRE Subject in Computer Science (Nov. 1997): **99%**	09/1995–07/1998
B.Sc. in Computer Science	Department of Computer Science, Shandong University, China Overall GPA: **89.0%**, GPA of Computer Science Courses: **90.9%**	09/1991–07/1995

Publications

Refereed publications:
- Fujian Liu, Yanping Zhao, **Wenguang Wang**, Dwight Makaroff. Database Server Workload Characterization in an E-commerce Environment. In *Proceedings of the 12th IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2004)*. Volendam, Netherlands. October 2004
- **Wenguang Wang**, Yanping Zhao, Rick Bunt. HyLog: A High Performance Approach to Managing Disk Layout. In *Proceedings of the 3rd USENIX File and Storage Technologies Conference (FAST 2004)*. San Francisco, CA. March 2004
- **Wenguang Wang**, Rick Bunt. A Self-tuning Page Cleaner for DB2. In *Proceedings of the 10th IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2002)*. Fort Worth, Texas. October 2002
- **Wenguang Wang**, Rick Bunt. Simulating DB2 Buffer Pool Management. In *Proceedings of CASCON 2000*. Toronto, Canada. November 2000
- **Wenguang Wang**, Yuchai Guo, Zongkai Lin, Shouxun Lin. The Design and Implementation of an Asynchronous Virtual Meeting System VMS. In Proceedings of the 7th *Chinese National Digital System Automatic Design & Cooperative Design Workshop*. Hebei, China. June 1997