

Zhongtang Cai

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OBJECTIVE:

A R&D or software engineer summer intern position with a focus on distributed systems, system modeling and optimization, test bed development, or related areas:

- High performance system and network software
- Design and development of robust fault-tolerant enterprise-scale distributed systems
- Network protocol design, implementation and integration.
- Analysis, modeling, and experimental evaluation of computer and network systems
- Experimental test beds integrating simulation, emulation and real systems

PERSONAL PROFILE:

- A self-motivated team player with background in operating systems, distributed systems, and networking.
- An experimentalist with hands-on experience in complex and innovative distributed systems design, implementation and evaluation, network protocol design and implementation, and large-scale network system modeling, optimization and performance evaluation.
- Dependable and reliable in enabling and supporting team effort to produce genuine long-term sustainable development.
- Strong verbal and written communication skills.

EDUCATION:

Georgia Institute of Technology, College of Computing, Atlanta, GA
Ph.D. in Computer Science, December 2006(expected). GPA: 4.0/4.0

Georgia Institute of Technology, College of Computing, Atlanta, GA
M.S. in Computer Science, May 2005. GPA: 4.0/4.0

Zhejiang University, Hangzhou, Zhejiang, China
B.S. in Computer Science, June 2001. GPA: 3.86/4.0 (GPA rank: the 1st in the department)

RESEARCH EXPERIENCE:

Graduate Research Assistant, 2001 – Present. Georgia Institute of Technology

1. Fault-Tolerant Enterprise-Scale Distributed System
 - Created fault tolerant enterprise operational information system to support self-resilient information flows.
 - Utilized high-level specification, and methods dealing with both transient and non-transient failures based on real-world case studies to offer: (1) information flows that dynamically self-determine availability methods and deployment based on the high-level service objective specifications, (2) system that is resilient to a wide-range of failures, meanwhile optimizes its fault-tolerance service parameters and performance to attain high availability, negligible recovery time(MTTR) and low run-time cost.
2. IQ-Services, Middleware support for Data Intensive Interactive Peer-to-Peer Applications
 - Designed and implemented middleware that enables continuous quality management for interactive, data intensive peer-to-peer applications in C, C++, XML and soap.
 - Actualized system and network level resource monitoring infrastructure and algorithms.

- Attained high performance data communication by use of efficient binary data communications, dynamic component coupling, and coordinated adaptation of applications, middleware and operation system kernel.
3. Resource-Aware Distributed Data Stream Management Infrastructure (DSMI)
 - Proposed and developed resource-aware DSMI in C++, SQL, and XML.
 - Designed and actualized overlay-based in-network data processing/aggregation, run-time service balance and dynamic service migration algorithms.
 4. IQ-RUDP: Network Layer Support for Efficient Large Data Transfers in Wide-Area Networks
 - Developed an application aware TCP friendly transport protocol in C
 - Built program constructs which coordinate the application and transport layer adaptations to network conditions, so as to best meet application needs without violating fairness in network usage.
 - Optimized the protocol for efficient large data transfer over wide-area network
 5. SmartPointers, Distributed Visualization Collaboration Application
 - Developed a distributed visualization and collaboration infrastructure in C and Java
 - Designed and implemented algorithms to enable real-time collaboration across heterogeneous platforms that range from high end engines like virtual reality systems driven by SMP servers to low end systems including desktops and PDAs.

Undergraduate Research Assistant. 1999 – 2001. Zhejiang University

1. Developed with teammates an intelligent robot which can automatically locate itself in unknown environments and find a path to clean the whole area of ground.
2. Implemented robot artificial intelligence algorithms for automatic environment discovery and path planning in unknown environment.

GRADUATE LEVEL COURSES:

1. **System and Software Engineering areas:** Software Development Process, Advanced Operating Systems, Distributed Computing, High Performance Parallel Computing,
2. **Network Areas:** Internet Architecture and Protocols, Wireless Networks, Evaluations of Communication Nets, Networked Applications and Services, Network Management.
3. **Computer Graphics Areas:** Computer Graphics, Computer Animation
4. **Mathematics Areas:** Computability Algorithm and Complexity, Probabilistic Models, Deterministic Optimization.

SELECTED INDUSTRIAL EXPERIENCE:

1. 6/2001—8/2001 Software Architecture Manager, HuiHeng Software Co. Ltd, China
 - Designed in UML and implemented in C++ a new financial management system as N-tier architecture.
2. 9/2000---11/2000 Exodus S.A. Athens, Greece.
Multilingual Real Estate E-Marketplace platform funded by the European Union
 - Designed the software architecture as server/client and N-tiers distributed model
 - Implemented the real estate E-Marketplace server in C++, ASP, SQL with COM, MTS, SQL Server support.
 - Implemented a template-based auto-translation engine which supports 8 languages in Europe.

TECHNICAL SKILLS:

- Programming Languages: C/C++, Java, C#, XML, SOAP, ASP, VBScript, JScript, HTML, Tcl/Tk.
- Software Engineering: Software Architecture, Software Process, UML, CMM, PSP, TSP, CleanRoom, ExtremeProgramming, Testing.
- Operating Systems: Windows, Linux, Familiar/Intimate(Linux OS on PDA), Unix, Solaris, Irix.

- Network: TCP/IP, SNMP, ICMP, VOD, NFS/NIS, Apache, IIS, P2P, Wireless network,
- Distributed & Parallel Computing: RPC, RMI, CORBA, Grid, MPI, OPENMP
- Database: Oracle, SQL Server, DB2.
- Computer Graphics and Animation.
- Mathematics: Mathematical Modeling. Matlab, Mathematica, Maple, Lingo&Lindo.

SELECTED PUBLICATIONS:

Book Chapters:

[1]"AutoFlow: Autonomic Information Flows for Critical Information Systems. Autonomic Computing: Concepts, Infrastructure, and Applications". K. Schwan, B. F. Cooper, G. Eisenhauer, A. Gavrilovska, M. Wolf, H. Abbasi, S. Agarwala, Z. Cai, V. Kumar, J. Lofstead, M. Mansour, B. Seshasayee, and P. Widener. ed. Manish Parashar and Salim Hariri, CRC Press, 2006.

Journals:

[2]"IQ-Services: Network-Aware Middleware for Interactive Large-Data Applications". Z. Cai, G. Eisenhauer, Q. He, V. Kumar, K. Schwan, M. Wolf. In Journal of IEEE Concurrency and Computation: Practice and Experience, 2006.

[3]"Middleware for Enterprise Scale Data Stream Management using Utility-Driven Self-Adaptive Information Flows". V. Kumar, B. F. Cooper, Z. Cai, G. Eisenhauer, K. Schwan. In Cluster Computing Journal, Springer Publishing, invited for publication, 2006.

Conferences Proceedings:

[4]"Towards Resilient Enterprise-Scale Information Flows". Z. Cai, V. Kumar, B. F. Cooper, G. Eisenhauer, K. Schwan, R. E. Strom. Submitted to IEEE International Conference on Autonomic Computing(ICAC) 2006.

[5]"IQ-Paths: Self-regulating Data Streams across Network Overlays". Z. Cai, V. Kumar, K. Schwan. Submitted to IEEE Symposium of High-Performance Distributed Computing(HPDC) 2006.

[6]" Implementing Diverse Messaging Models with Self-Managing Properties using IFLOW". V. Kumar, Z. Cai, B. Cooper, G. Eisenhauer, K. Schwan, M. Mansour, B. Seshasayee, and P. Widener. Submitted to IEEE International Conference on Autonomic Computing(ICAC) 2006.

[7]"Resource-Aware Distributed Stream Management using Dynamic Overlays". V. Kumar, B. Cooper, Z. Cai, G. Eisenhauer, K. Schwan. Proc. of IEEE ICDCS(International Conference on Distributed Computing Systems) 2005.

[8]"Smart Pointers: Personalized Scientific Data Portals in Your Hand" M. Wolf, Z. Cai, W. Huang, and K. Schwan. Proc. of ACM/IEEE Super Computing, November 2002.

Workshops:

[9]"IQ-Services: Network-Aware Middleware for Interactive Large-Data Applications.". Z. Cai, G. Eisenhauer, Q. He, V. Kumar, K. Schwan, M. Wolf. Proc. of 2nd International Workshop on Middleware & Grid Computing, MGC-2004.

[10]"Resource-Aware Middleware for Heterogeneous Applications". Z. Cai, G. Eisenhauer, C. Poellabauer, K. Schwan, and M. Wolf. Proc. of the 13th IEEE/ACM Heterogeneous Computing Workshop (HCW 2004) (invited paper), April 2004.

Technical Reports:

[11]"Autonomic Information Flows". GIT-CERCS-05-22. K. Schwan, B. F. Cooper, G. Eisenhauer, A. Gavrilovska, M. Wolf, H. Abbasi, S. Agarwala, Z. Cai, V. Kumar, J. Lofstead, M. Mansour, B. Seshasayee, and P. Widener.

[12]"IQ-Services: Network-Aware Middleware for Interactive Large-Data Applications". GIT-CERCS-04-07. Z. Cai, G. Eisenhauer, Q. He, V. Kumar, K. Schwan, M. Wolf.

Mathematical Modeling Papers:

[13]"Model of Population Dynamics of Zebra Mussels and its Application". Z. Cai, X. Lin, M. Ji. International Mathematical Contest in Modeling 2001. Meritorious Award.

[14]"Safety, Low Workload, or Both – Collision Detection Software in Air Traffic Control System". J. Yang, Z. Cai, X. Wang. International Mathematical Contest in Modeling 2000. Meritorious Award. Also published in Collection of Best Papers in International MCM, Zhejiang University 2000.

SELECTED HONORS AND AWARDS:

- President Scholarship, 2001.
- Zhejiang University Scholarship, First Prize, 1998, 1999, 2000, and 2001.
- Outstanding Graduated Student of Zhejiang Province, 2001
- Zhejiang Province Young Talent Award with Highest Honor, 2001
- Best Graduation Paper, 2001.
- National Nandu Scholarship, First Prize, 2000
- Meritorious Award in the 2001 International Mathematical Contest in Modeling. (Administrated by the Consortium for Mathematics and its Applications, USA)
- Meritorious Award in the 2000 International Mathematical Contest in Modeling.
- Excellent Leader of Zhejiang University's Student Union, 1998.
- Zhejiang University Freshmen Scholarship, First prize, 1997.

REFERENCES:

Available upon request