

# Chaoyue (Joy) Xiong

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## OBJECTIVE

Looking for a challenging and creative position in the area of network engineering, software engineering or performance analysis in computer system, data and telecommunication networking, and information technology company.

## SUMMARY OF QUALIFICATIONS

- Comprehensive knowledge of Networking technologies
- Strong research skill and programming background
- Working experience in one of the largest IT companies

## COMPUTER SKILLS

Networking: TCP/IP, UDP, PPP, VPN, SSL, MPLS, SONET, ATM, Frame relay

Languages: C/C++, Java, Assembly, Pascal, COBOL, SQL, PERL, XML

Databases: DB2, Oracle, MSAccess

OS: UNIX (Solaris), Windows, Linux

Software: VisualCafe, Delphi, VisualAge Java, Lotus 1-2-3, Matlab, Rational Rose

## EDUCATION

Degree expected May 2005	Ph.D. in Computer Science. University of Illinois at Chicago, Chicago, IL Dissertation title: <i>Protocol Modeling, Analysis and Design</i> Advisors: Dr. Tadao Murata and Dr. Jason Leigh
Degree granted February 1999	M.S. in Electrical Engineering. Shanghai Jiao Tong University, Shanghai, China Thesis title: Reachability Analysis of Petri Nets Advisor: Dr. Guojun Ding
Degree granted July 1996	B.S. in Electrical Engineering Harbin Engineering University, Harbin, China

## EMPLOYMENT HISTORY

2003-present	Research Assistant at Electronic Visualization Laboratory University of Illinois at Chicago Supported by NSF grants
2001 - 2002	Research Assistant at Concurrent System Software Laboratory University of Illinois at Chicago Supported by NSF grants

Multiple semesters during PhD study	Teaching Assistant at Department of Computer Science University of Illinois at Chicago,
1999 - 2000	IT Specialist IBM Shanghai, China

## PROJECTS

- **LambdaStream** (May 2003, ongoing) (Part of OptIPuter): Analyze system performance and conduct performance analysis of transport protocols over high-speed networks; Design and implement a gigabit-level streaming data transport protocol for OptIPuter project: one of the largest NSF-funded ITR to develop a distributed high-performance cyber-infrastructure supporting data-intensive scientific research and collaboration. Experimental results on a wide range of networks, such as the National Lambda Rail and the Starlight connection between Chicago and Amsterdam, show that the protocol work very well for supporting real-time streaming of super high definition graphics. Integrations of the protocol into several OptIPuter applications are under way.

Work intensively with C++, TCP/IP, UDP, OOP, OOD, socket programming and POSIX threads programming; Experience with MPI, CVS, PERL, Tcl.
- **Performance Modeling and Analysis of Real-Time Distributed Systems** (January 2001, ongoing): Apply a formal method to conduct performance analysis and verification for real-time distributed systems, with an emphasis on wireless network protocols. This research has led to two major results: 1) Propose an improved transport protocol for wireless networks; 2) Extend the formal method to increase its modeling power and to enable its applicability to emerging technologies.
- **A Sort-Last Rendering System on a Computing Cluster for Optical Backplane** (May 2003): Design and implement a classic rendering technique for cluster computers called Sort-last rendering; Analyze and monitor the system to search performance bottleneck; Optimize the synchronization algorithm of the system, which resulted in improved load balancing between the graphical rendering system and the remote data source feeding the rendering system. Work with C++, TCP/IP, socket programming, OpenGL
- **Duplex Stop-and-wait Protocol** (April 2001): A course project to simulate the stop-and-wait protocol over an unreliable physical layer. Worked with C++ and Sockets programming on Sun-Solaris platform.
- **Network Battleship Game** (October 2002): Design and implement a distributed client-server system to implement the battleship game. Worked with Java, socket programming and GUI design
- **Network Library Application System** (November 2002): Design and implement a distributed client-server system to manage library items, patrons and normal library activities (borrow, return items etc). Worked with Java, Java RMI, Pattern Design (Factory, Proxy and Observer) and GUI design.

- **Single CPU Multi-Level Queue Scheduler** (November 2001): Simulate a multi-layer CPU scheduling policy (involving with RR, SJF, FCFS and priority); Use turnaround time and average waiting time to analyze its performance. Worked with C.
- **Process Synchronization** (September 2001): Apply system V semaphore and shared memory to enforce executing order among processes. Worked with C, system V shared memory, system V shared semaphore and Pipe.
- **UML Converter** (March 2002): A system to convert UML diagrams to SMC (Symmetry Based Model Checker) to enable formal analysis of the UML modeled system. Worked with Java and XML.
- **Healthcare Information System** (July 2000): A client-server system to assist normal businesses for a large hospital (Shanghai First People Hospital having about 2200 employees). Experienced with all aspects of the software lifecycle; Worked intensively with C/COBOL, Unix-shell script, DB2, Delphi, WIN API, and GUI design. Because of excellence in doing the project, I received the Best Employee Award at the System Integration Service Center in IBM Shanghai for winter 1999.

## TEACHING ACTIVITY

1. Fall 2004, 2003 and 2002. Teaching Assistant for Advanced Topics in Concurrent Computing Systems (CS554).
2. Spring 2004, 2003 and 2002. Teaching Assistant for Applied Graph Theory (CS503).
3. Spring 2003, Spring 2002 and Fall 2001. Teaching Assistant for Introduction to Networking (CS450).
4. Fall 2002, Fall 2001 and Summer 2001. Teaching Assistant for Computer Architecture (CS360).
5. Fall 2000. Teaching Assistant for Circuit Design (EECS340).
6. Summer 2002 and Spring 2003. Co-advising graduate students, working on their master thesis.
7. Spring 2003. Instructing a biology professor and his students to use Design/CPN.
8. 2000. Training employees in Shanghai First People Hospital to use the Healthcare Information System.

## PUBLICATIONS

1. C.Xiong, J. Leigh, E. He, T. Murata, L. Renambot, T. A. DeFanti, "LambdaStream -- a Data Transport Protocol for Network-intensive Streaming Applications over Photonic Networks", accepted by Third International Workshop on Protocols for Fast Long-Distance Networks (PFLDnet'05)
2. C. Xiong, J. Yim, J. Leigh and T. Murata, "TCP Improvement over Mobile Ad Hoc Networks", Proceedings of 2004 International Conference on Computing, Communications and Control Technologies (CCCT '04), August 14-17, 2004, Austin, Texas, USA
3. Y. Kirihata, J. Leigh, C. Xiong and T. Murata, "A Sort-Last Rendering System Over an Optical Backplane," Proceedings of the 10th International Conference on Information Systems Analysis and Synthesis (ISAS 2004) and the International Conference on Cybernetics and Information Technologies, Systems and Applications (CITSA 2004), Vol.1, pp.42-47, Orlando, Florida, July 21 - 25, 2004. CITSA 2004 Best Paper Award at Computing Technologies III.
4. C. Xiong, T. Murata and J. Leigh, "An Approach to Verifying Routing Protocols in Mobile Ad Hoc Networks Using Petri Nets", Proceedings of IEEE 6th CAS Symposium on Emerging Technologies Frontiers of Mobile and Wireless Communication, pp.537-540, May 31-June 2, 2004, Shanghai, China

5. C. Xiong and T. Murata, "Verification of AODV Protocol", Proceedings of 2004 Midwest Software Engineering Conference (MSEC'04), pp.23-31, Apr. 30, 2004, Chicago, IL, USA
6. M. Goutelle, Y. Gu, E. He, S. Hegde, R. Kettimuthu, J. Leigh, P. Primet, M. Welzl and C. Xiong, "A Survey of Transport Protocols other than Standard TCP", Global Grid Forum White Paper Draft, Feb. 2004
7. C. Xiong, T. Murata and J. Tsai, "Modeling and Simulation of Routing Protocol for Mobile Ad Hoc Networks Using Colored Petri Nets," Research and Practice in Information Technology, vol. 12, pp. 145-153, Australian Computer Society, 2002.
8. C. Xiong and G. Ding, "Reachability Analysis of Regular Petri Nets" (in Chinese), Journal of Computer Science, Vol. 7, No. 5, May 1999, pp. 10-19

#### **UNDER REVIEW**

1. C.Xiong, J. Leigh, T. Murata, "Nonlinear Multiplicative Increase and Multiplicative Decrease Congestion Control", submitted to Third Workshop on Grids and Advanced Networks (GAN'05)

#### **IN PREPARATION**

1. C.Xiong, J. Leigh, and T. Murata, "A Data Transport Protocol for Network-intensive Streaming Applications on the Grids", for Journal of Grid Computing.
2. C.Xiong, T. Murata, and J. Leigh, "A Petri-net based Approach for Verifying Protocols over Mobile Architecture", for IEEE Transaction on Software Engineering.

#### **TECHNICAL REPORTS**

1. C. Xiong "Verification and Performance Analysis of Routing Protocols for Mobile Ad Hoc Networks," *Ph.D. Thesis Proposal*, CS Department, The University of Illinois at Chicago, March 2003.
2. C. Xiong "an Extension of Colored Petri Nets for Verification of Routing Protocols for Mobile Ad Hoc Networks," *Ph.D. Student Seminar*, Computer Science Department, The University of Illinois at Chicago, May 2002.

#### **TECHNICAL PRESENTATIONS**

1. "An Approach to Verifying Routing Protocols in Mobile Ad Hoc Networks Using Petri Nets" at IEEE 6th CAS Symposium on Emerging Technologies Frontiers of Mobile and Wireless Communication
2. "Verification of AODV Protocol" at MSEC'04

#### **PROPOSAL WRITING EXPERIENCES**

Participated in writing two proposals submitted to NSF NeTS (Networking Technology and System) for funding applications.

#### **AWARDS**

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| 2004.7  | CITSA 2004 Best Paper Award at Computing Technologies Session |
| 2002.11 | IFTP TC6 Student Travel Scholarship                           |
| 1999.12 | Best Employee Award of SISC department in IBM, Shanghai       |

Fall 1998      Rockwell Automation Scholarship, Shanghai Jiao Tong University, China  
Fall 1996      Guanghai Scholarship, Shanghai Jiao Tong University, China  
1992-96      Dean's scholarship for each semester, Harbin Engineering University, China

**REFERENCES**

Available Upon Request