

- Objective** I aspire to become a graduate fellow of the Symantec research labs where I can utilize my experience and excellent skills in the fault tolerance and distributed computing field. My knowledge would surely prove to be an asset for Symantec's businesses of information availability and integrity.
- Research Interests** My research interests lie in the area of large-scale parallel and distributed computing. In particular, I am interested in designing efficient and fault-tolerant algorithms and systems in dynamic distributed environment, with rigorous guarantee of performance and reliability.
- Education**
- Ph.D. in Computer Science, Yale University, 2012 (expected).  
Advisor: Professor Michael J. Fischer.  
Research Area: Theory of Parallel and Distributed Computing.
- M.Sci. in Computer Science, Yale University, 2009.
- M.Phil. in Electronic Engineering, City University of Hong Kong, 2007.  
Advisor: Doctor Sammy Chan.  
Research Area: Distributed Resource Management in Wireless Ad Hoc Networks.
- B.Eng. in Commu. and Info. Engineering, Univ. of Elec. Sci. & Tech. of China, 2005.  
Rank: 1 out of 292.
- Research Experience**
- Product Development Intern**, Oracle Inc., Redwood Shores, CA. June - August 2011  
I work on Oracle in-database Hadoop, the source compatible solution that integrates Hadoop with database. In particular,
- I designed and implemented the in-database framework that accepts Hadoop code written in Java and executes it in Oracle database.
  - I implemented an operation mode that generalizes the standard Hadoop by allowing users to compose SQL queries that include the underlying Map/Reduce functions.
  - I designed programs for scalability test.
- Software Engineering Intern**, Google Inc., New York, NY. June - August 2010  
I work on Colossus, the next generation of Google File System (GFS) that serves as the main storage platform for Google. In particular,
- I designed and implemented chunk placement algorithms to significantly reduce the data loss probability in case of burst failures;
  - I designed and implemented chunk allocation algorithms to greatly improve the aggregate read/write throughput of Colossus;
  - I derived theoretical analysis for the proposed algorithms.
- Research Assistant**, Yale University. 2007 - present  
I focus on achieving efficiency and fault tolerance in dynamic distributed environments where participating agents might be cooperative, selfish or even malicious. The environments under study encompass a variety of practical systems, including distributed file systems, MapReduce-like parallel computing systems, and Ad Hoc networks.
- I am currently working on the design of a distributed file system where the online chunk allocation algorithms achieves small competitive-ratio in service latency compared to offline optimal algorithms coupled with adversary;
  - Compared to the round robin algorithm implemented in Hadoop (open source version of MapReduce) that deviates from optimal by a multiplicative gap, I designed an efficient algorithm that employs maximum flow and increasing threshold techniques to compute task assignments that are optimal to within an additive constant;
  - I proposed FORBID, a flocking oriented Bayesian inference mechanism with active detections to cope with several typical malicious behaviors in packet forwarding in wireless ad hoc networks;

- I adapted generalized second price (GSP) auction mechanism from Internet advertisement business to multi-path routing in ad hoc networks with rational participants, such that truth-telling Nash equilibria are achieved and the over-payment from the widely used Vickrey-Clark-Groves (VCG) mechanism is alleviated.

**Visiting Scholar**, FuNLab, University of Washington. September - December 2006  
I study link-aware routing metrics and protocols in wireless mesh networks.

**Research Assistant**, City University of Hong Kong. 2005 - 2007  
My research efforts go into distributed resource allocation and scheduling in wireless ad hoc networks, ranging from fair rate allocation in the transport layer, to robust multicast in the routing layer, and to bandwidth allocation in the media access control layer.

- I developed a robust multicast routing protocol that predicts future link availability as routing metric and sets up local alternative paths for vulnerable links, thus the reliability of the whole multicast tree is improved;
- I proposed an allocation scheme to decompose network-wide traffic into maximal cliques and charge clique-based prices, such that multi-hop flows adjust their transmission rate dynamically according to network congestion and demand functions;
- I designed a MAC layer protocol for coordinating transmissions among flows, such that the allocated rates from the transport layer are guaranteed.

## Teaching Experience

**Teaching Fellow**, Yale University. 2008 - present

- CPSC365, Design and Analysis of Algorithms, Spring 2011.
- OPRS235/ENAS525 Optimization, Fall 2009, Fall 2010, Fall 2011.
- CPSC201 Introduction to Computer Science, Spring 2009.
- CPSC467/567 Cryptography and Computer Security, Fall 2008, Spring 2010.

**Teaching Assistant**, City University of Hong Kong. 2005 - 2006

- EE4316 Mobile Data Networks, Spring 2006.
- EE3900 Computer Networks, Fall 2005.

Duties include leading lab sessions, holding weekly review sessions and office hours, and grading assignments, projects, and exams.

## Awards & Honors

### *Academic:*

- Finalist, Symantec Research Labs Graduate Fellowship, 2010.
- Kempner Fellowship, 2009 - 2010.
- Yale University Sheffield Scholarship, 2008 - 2009.
- Frederick W. Vanderbilt Fellowship, 2008 - 2009.
- Yale University Fellowship, 2007 - 2008.
- City University of Hong Kong Fellowship, 2005 - 2007.
- Graduate with Honor, Sichuan Province, China, 2005.
- Top Grade, Chinese National Fellowship, 2001 - 2004.

### *Conferences and Contests:*

- Travel Grant, ACM SPAA, 2010.
- Travel Award, IEEE MASS, 2006.
- Outstanding Winner (top 4 champion), Interdisciplinary Contest in Modeling, funded by U.S. National Science Foundation and National Security Agency, 2004.
- First-place Winner (top 2% nation-wide), Chinese Undergraduate Mathematical Contest in Modeling, 2003.

## Publications

### Working Papers:

- [1] Chunk Allocation for Fault Tolerance and Efficiency. *In progress*.

### Conference Papers:

- [2] **Xueyuan Su**, Gang Peng, and Sammy Chan. FORBID: Cope with Byzantine Behaviors in Wireless Multi-Path Routing and Forwarding. *Proceedings of the IEEE Global Communications Conference (GLOBECOM)*, 2011, to appear.
- [3] **Xueyuan Su**, and Sammy Chan. High Throughput Routing with Superposition Coding and Successive Interference Cancellation. *Proceedings of the IEEE International Conference on Communications (ICC)*, 2011.
- [4] Michael J. Fischer, **Xueyuan Su**, and Yitong Yin. Assigning Tasks for Efficiency in Hadoop. *Proceedings of the ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2010, 30-39.
- [5] **Xueyuan Su**, Sammy Chan, and Gang Peng. Generalized Second Price Auction in Multi-Path Routing with Selfish Nodes. *Proceedings of the IEEE Global Communications Conference (GLOBECOM)*, 2009, 3413-3418.
- [6] **Xueyuan Su**, and Sammy Chan. Cross-layer MAC Design for Bandwidth Allocation in Wireless Ad Hoc Networks. *Proceedings of the 12th International Symposium on Wireless Personal Multimedia Communications (WPMC)*, 2009.
- [7] **Xueyuan Su**, Sammy Chan, and King-Sun Chan. RLAR: Robust Link Availability Routing Protocol for Mobile Ad Hoc Networks. *Proceedings of the IEEE International Conference on Communications (ICC)*, 2007, 4759-4766.
- [8] **Xueyuan Su**, and Sammy Chan. Max-min Fair Rate Allocation in Multi-hop Wireless Ad Hoc Networks. *Proceedings of the Third IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, 2006, 513-516.

### Journal Papers:

- [9] **Xueyuan Su**, Sammy Chan, and Jonathan H. Manton. Bandwidth Allocation in Wireless Ad Hoc Networks: Challenges and Prospects. *IEEE Communications Magazine*, 48(1), 2010, 80-85.
- [10] **Xueyuan Su**, Sammy Chan, and Gang Peng. Auction in Multi-path Multi-hop Routing. *IEEE Communications Letters*, 13(2), 2009, 154-156.
- [11] Qian Zhao, **Xueyuan Su**, and Yunji Song. Catch Thieves Online: IT Security. *The UMAP Journal of Undergraduate Mathematics and its Applications*, 25(2), 2004, 157-170.

### Other Papers:

- [12] Michael J. Fischer, **Xueyuan Su**, and Yitong Yin. A Matching Lower Bound of the Flow-Based Algorithm for Hadoop Task Assignment Problem. *Yale University Computer Science Technical Report*, to appear.
- [13] Michael J. Fischer, **Xueyuan Su**, and Yitong Yin. Assigning Tasks for Efficiency in Hadoop. *Yale University Computer Science Technical Report YALE/DCS/TR1423*, 2010.
- [14] **Xueyuan Su**. Distributed Resource Management in Wireless Ad Hoc Networks. *M.Phil. thesis, City University of Hong Kong*, 2007.

## Professional Activities

### Talks:

- Summer 2010: Google Inc., New York. "Assigning Tasks for Efficiency in Hadoop" by Fischer, Su, and Yin.
- Summer 2010: ACM SPAA 2010, Santorini, Greece. "Assigning Tasks for Efficiency in Hadoop" by Fischer, Su, and Yin.
- Summer 2008: Networking group, City University of Hong Kong. "Auction in Multi-path Multi-hop Routing" by Su, Chan, and Peng.
- Summer 2007: ICC 2007, Glasgow, Scotland. "RLAR: Robust Link Availability Routing Protocol for Mobile Ad Hoc Networks" by Su, Chan, and Chan.
- Fall 2006: MASS 2006, Vancouver, Canada. "Max-min Fair Rate Allocation in Multi-hop Wireless Ad Hoc Networks" by Su, and Chan.

*Reviewer for:*

- IEEE WCNC'10, IEEE ICNP'08, IEEE GLOBECOM'07, ICST BodyNets'07.
- IEEE Transactions on Wireless Communications, IEEE Transactions on Mobile Computing, IEEE Communications Letters, Springer Wireless Personal Communications, Elsevier Ad Hoc Networks, Wiley Security and Communication Networks.

*Author of:*

- “OP\_TOOLS” Excel add-in for *Linear Programming and Generalizations: A Problem-based Approach with Spreadsheets (International Series in Operations Research & Management Science)*, by Eric V. Denardo.

*Student Member of:*

- IEEE (2006 - present), SIAM (2009 - present).

*Board Member and Website Architect of:*

- Association of Chinese Students & Scholars at Yale (ACSSY), 2008 - 2009.