

# Yin Zhang

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## RESEARCH INTERESTS

*Computer networks* in general, with particular interests in network management, measurement, and security.

## EDUCATION

CORNELL UNIVERSITY, 08/1997–08/2001 Ithaca, NY  
Ph.D. in Computer Science  
Advisors: Dr. Vern Paxson and Dr. Robbert van Renesse  
Dissertation: Characterizing End-to-end Internet Performance

CORNELL UNIVERSITY, 08/1997–05/1999 Ithaca, NY  
M.S. in Computer Science  
Advisor: Prof. Srinivasan Keshav

PEKING UNIVERSITY, 09/1992–07/1997 Beijing, China  
B.S. in Computer Science

## HONORS AND AWARDS

- Best Paper Award, ACM CoNEXT Conference, 2011.
- Faculty Fellowship #9 in Computer Science, The University of Texas at Austin, 2008 – 2011.
- IEEE Senior Member, 2007.
- National Science Foundation Faculty Early Career Award, 2006.
- Two SIGCOMM 2003 papers selected for fast-track publication by IEEE/ACM Transactions on Networking.
- Research Excellence Award, AT&T Labs–Research, 2001.
- Best Student Paper Award, 9th USENIX Security Symposium, 2000.
- Gold Medal, 33rd International Mathematical Olympiad (IMO), 1992.
- First Prize, Chinese High School Mathematics Competition, 1991.

## WORK EXPERIENCE

THE UNIVERSITY OF TEXAS AT AUSTIN, DEPT. OF COMPUTER SCIENCE, 09/2010– Austin, TX  
*Associate Professor.* Working on network management, network measurement, and security.

THE UNIVERSITY OF TEXAS AT AUSTIN, DEPT. OF COMPUTER SCIENCE, 01/2005–08/2010 Austin, TX  
*Assistant Professor.* Worked on network management, network measurement, and security.

AT&T LABS–RESEARCH, 06/2001–12/2004 Florham Park, NJ  
*Senior Technical Staff Member* (06/2001–04/2004), *Senior Technical Specialist* (04/2004–12/2004).  
Worked on traffic engineering, network measurement, streaming algorithms, routing, and anomaly detection.

AT&T CENTER FOR INTERNET RESEARCH AT ICSI, 06/1999–02/2001 Berkeley, CA  
*Research Intern.* Worked with Vern Paxson on network measurement and intrusion detection.

CORNELL UNIVERSITY, COMPUTER SCIENCE DEPARTMENT, 08/1998–06/1999 Ithaca, NY  
*Research Assistant.* Worked with Srinivasan Keshav on TCP performance analysis and improvement.

BELL LABS, LUCENT TECHNOLOGIES, 06/1998–08/1998  
*Research Intern.* Worked with Hong-Yi Tzeng on scalable atomic multicast.

Homdel, NJ

### TEACHING EXPERIENCE

THE UNIVERSITY OF TEXAS AT AUSTIN, DEPT. OF COMPUTER SCIENCE, 01/2005– Austin, TX  
Instructor for courses: CS356 Computer Networks (Fall 2007); CS378 Network Measurement and Intrusion Detection (Fall 2006); CS378 Advanced Computer Networks (Spring 2009); CS386M Communication Networks (Fall 2005, Spring 2007, Spring 2008, Fall 2008); CS395T Advanced Topics in Computer Networks (Spring 2006); CS395T Network Measurement and Inference (Spring 2005).

CORNELL UNIVERSITY, COMPUTER SCIENCE DEPT., 08/1997–06/1998 Ithaca, NY  
Teaching Assistant for courses: CS410 Data Structures; CS211 Computers and Programming; CS099 Fundamental Programming Concepts.

### PROFESSIONAL ACTIVITIES

#### Editorial Board:

- Area Editor, ACM Computer Communication Review (CCR).

**Organization Committee Member:** IEEE ICNP 2012 (TPC Co-chair), ACM ANCS 2009 (Publicity Chair), ACM SIGCOMM 2008 (Publicity Chair), ACM SIGMETRICS Workshop on Large-Scale Network Inference 2005 (Organization and TPC Chair).

#### Program Committee Member:

- ACM SIGCOMM (2011, 2010, 2009, 2007, 2006, 2004)
- ACM SIGMETRICS (2006)
- IEEE INFOCOM (2011, 2010, 2009, 2008, 2006, 2005, 2004)
- IEEE ICNP (2011, 2010, 2009, 2008)
- ACM/USENIX Internet Measurement Conference (IMC) (2008, 2007, 2005)
- ACM CoNEXT (2009)
- IEEE/ACM Symposium on Architectures for Networking and Communications Systems (ANCS) (2008, 2007)
- International World Wide Web Conference (WWW) 2007
- ACM SIGMETRICS MineNet Workshop 2007
- IEEE International Conference on Communication Systems and Networks (COMSNETS) (2011, 2009)
- IEEE Automated Network Management Workshop (ANM) 2008
- International Conference on Security and Privacy in Communication Networks (SecureComm) 2008
- IEEE International Workshop on Quality of Service (IWQoS) 2007
- IFIP/IEEE International Symposium on Integrated Management (IM) 2007
- ACM Sigcomm Workshop on Internet Network Management (INM) (2007, 2006)
- IEEE International Conference on Distributed Computing Systems (ICDCS) 2006
- Passive and Active Measurement Conference (PAM) 2010
- International Teletraffic Congress (ITC) 2011

### GRANTS

1. CIF: Small: Compressive Network Analytics, Research Grant CCF-1117009, National Science Foundation, Principal Investigator: Yin Zhang, with Lili Qiu as co-PI, 09/01/2011–08/31/2014.

2. NetSE: Small: Multi-Resolution Analysis of Network Matrices, Research Grant CCF-0916309, National Science Foundation, Principal Investigator: Yin Zhang, with Lili Qiu and Inderjit Dhillon as co-PIs, 09/01/2009–08/31/2012.
3. TC: Large: A Formal Platform for Analyzing Internet Routing, Research Grant CNS-0910913, National Science Foundation, Principal Investigator: Sandip Ray, with Warren A. Hunt, Jr. and Yin Zhang as co-PIs, 09/01/2009–08/31/2011.
4. NeTS: Small: Predictable Optimization of Opportunistic Communication, Research Grant CNS-0916106, National Science Foundation, Principal Investigator: Lili Qiu, with Yin Zhang as co-PI, 09/01/2009–08/31/2012.
5. CAREER: SMART – A Scalable Monitoring, Analysis, and Response Toolkit for the Internet, Research Grant CNS-0546720, National Science Foundation, Principal Investigator: Yin Zhang, 09/01/2006–08/31/2011.
6. Collaborative Research: NeTS–NBD: Traffic Engineering in an Uncertain World, Research Grant CNS-0627020, National Science Foundation, Principal Investigator: Yin Zhang, with Lili Qiu and Simon Lam as co-PIs, 09/01/2006–08/31/2009.
7. CSR–PDOS: Autonomic Systems: Integrating Machine Learning with Computer Systems, Research Grant CNS-0615104, National Science Foundation, Principal Investigator: Emmett Witchel, with Vitaly Shmatikov, Yin Zhang, Peter Stone, and Raymond Mooney as co-PIs, 08/01/2006–07/31/2009.
8. Unrestricted Gift from AT&T’s Virtual University Research Initiative (VURI) for research on exploratory data mining in support of network troubleshooting, Principal Investigator: Yin Zhang, 09/01/2009–present.
9. Unrestricted Gift from AT&T’s Virtual University Research Initiative (VURI) for networking research, Principal Investigator: Yin Zhang, 12/01/2008–present.
10. RapidTrace: Rapid Traceback of Cyber Attacks, Grant from Telcordia Technologies (subcontract from ARDA/DTO’s Network Attack Traceback program under Contract Number FA8750-05-C-0268), Principal Investigator: Yin Zhang, 10/01/2005–3/30/2007.
11. XML-based Information Dissemination, Grant from AT&T’s Virtual University Research Initiative (VURI), Principal Investigator: Yin Zhang, 02/01/2006–01/31/2007.
12. Unrestricted Gift from Cisco’s Critical Infrastructure Assurance Group (CIAG) (in support of network security research), Principal Investigator: Yin Zhang, with Raymond Mooney as co-PI, 10/2006.

## JOURNAL PAPERS

The following papers can be downloaded from <http://www.cs.utexas.edu/~yzhang/papers/>.

1. Mikkel Thorup and Yin Zhang, “Tabulation Based 5-independent Hashing with Applications to Linear Probing and Second Moment Estimation,” to appear in *SIAM Journal on Computing (SICOMP)*, 2012.
2. Matthew Roughan, Yin Zhang, Walter Willinger and Lili Qiu, “Spatio-temporal Compressive Sensing and Internet Traffic Matrices,” accepted to appear in *IEEE/ACM Transactions on Networking*, 2011.
3. Matthew Roughan and Yin Zhang, “Symbiotic Inter-Domain Traffic Engineering,” accepted to appear in the *Special Issue of Telecommunication Systems Journal*, dedicated to *GameComm’08*, 2009.
4. Han Hee Song, Lili Qiu and Yin Zhang, “NetQuest: A Flexible Framework for Large-Scale Network Measurement,” in *IEEE/ACM Transactions on Networking*, vol. 17, no. 1, pp. 106–119, February 2009.
5. Ying Zhang, Zihui Ge, Suhas Diggavi, Z. Morley Mao, Matthew Roughan, Vinay Vaishampayan, Walter Willinger, and Yin Zhang, “Internet Traffic and Multiresolution Analysis,” *IMS Collections, Volume 4, “Markov Processes and Related Topics: A Festschrift for Thomas G. Kurtz,”* Stewart N. Ethier, Jin Feng, Richard H. Stockbridge, Editors, Editors, 2008.
6. Robert Schweller, Zhichun Li, Yan Chen, Yan Gao, Ashish Gupta, Elliot Parsons, Yin Zhang, Peter Dinda, Ming-Yang Kao and Gokhan Memik, “Reversible Sketches: Enabling Monitoring and Analysis over High-speed Data Streams,” in *IEEE/ACM Transactions on Networking*, vol. 15, no. 5, pp. 1059–1072, October 2007.
7. Lili Qiu, Yang Richard Yang, Yin Zhang and Scott Shenker, “On Selfish Routing in Internet-like Environments,” in *IEEE/ACM Transactions on Networking*, vol. 14, no. 4, pp. 725–738, August 2006.

8. Matthew Roughan and Yin Zhang, "Secure Distributed Data Mining and its Application in Large-Scale Network Measurements," in *ACM SIGCOMM Computer Communication Review (CCR)*, January 2006.
9. Yin Zhang, Matthew Roughan, Carsten Lund and David Donoho, "Estimating Point-to-Point and Point-to-Multipoint Traffic Matrices: An Information-Theoretic Approach," in *IEEE/ACM Transactions on Networking*, vol. 13, no. 5, pp. 947–960, October 2005.
10. Lili Qiu, Yin Zhang and Srinivasan Keshav, "Understanding the Performance of Many TCP Flows," *Computer Networks*, vol. 37, no. 3–4, pp. 277–306, November 2001.
11. Li-ang Zhang and Yin Zhang, "Approximation for Knapsack Problems with Multiple Constraints," *Journal of Computer Science and Technology*, vol. 14, no. 4, July 1999, Allerton Press, Inc.
12. Yin Zhang and Zhuoqun Xu, "Concurrent Manipulation of Expanded AVL Trees," *Journal of Computer Science and Technology*, vol. 13, no. 4, July 1998, Allerton Press, Inc.

#### REFEREED CONFERENCES

The following papers can be downloaded from <http://www.cs.utexas.edu/~yzhang/papers/>.

1. Vacha Dave, Saikat Guha, and Yin Zhang, "Measuring and Fingerprinting ClickSpam in Online Ad Networks," in *Proceedings of 2012 ACM SIGCOMM Conference*, Helsinki, Finland, August 2012.
2. Han Hee Song, Berkant Savas, Tae Won Cho, Vacha Dave, Zhengdong Lu, Inderjit Dhillon, Yin Zhang, and Lili Qiu, "Clustered Embedding of Massive Social Networks," in *Proceedings of 2012 ACM SIGMETRICS Conference*, London, United Kingdom, June 2012.
3. Ajay Mahimkar, Zihui Ge, Jia Wang, Jennifer Yates, Yin Zhang, Joanne Emmons, Brian Huntley, and Mark Stockert, "Rapid Detection of Maintenance Induced Changes in Service Performance," in *Proceedings of the 7th International Conference on emerging Networking EXperiments and Technologies (CoNEXT 2011)*, Tokyo, Japan, December 2011. **Best Paper Award** recipient.
4. Han Hee Song, Zihui Ge, Ajay Mahimkar, Jia Wang, and Jennifer Yates, Yin Zhang, Andrea Basso, and Min Chen, "Q-score: Proactive Service Quality Assessment in a Large IPTV System," in *Proceedings of the Internet Measurement Conference (IMC 2011)*, Berlin, Germany, November 2011.
5. Tianji Li, Mi Kyung Han, Apurv Bhartia, Lili Qiu, Eric Rozner, and Yin Zhang, "CRMA: Collision-Resistant Multiple Access," in *Proceedings of the 17th Annual International Conference on Mobile Computing and Networking (MobiCom 2011)*, Las Vegas, Nevada, USA, September 2011.
6. Han Hee Song, Zihui Ge, Ajay Mahimkar, Jia Wang, Jennifer Yates, and Yin Zhang, "Analyzing IPTV Set-Top-Box Crashes," in *Proceedings of the ACM SIGCOMM Workshop on Home Networks (HomeNets 2011)*, Toronto, ON, Canada, August 2011.
7. Eric Rozner, Mi Kyung Han, Lili Qiu, and Yin Zhang, "Model-driven Optimization of Opportunistic Routing," in *Proceedings of the 2011 ACM SIGMETRICS Conference*, San Jose, California, USA, June 2011.
8. Wei Dong, Vacha Dave, Lili Qiu, and Yin Zhang, "Secure Friend Discovery in Mobile Social Networks," in *Proceedings of the 30th IEEE International Conference on Computer Communications (Infocom 2011)*, Shanghai, China, April 2011.
9. Upendra Shevade, Yi-Chao Chen, Lili Qiu, Yin Zhang, Vinoth Chandar, Mi Kyung Han, Han Hee Song, and Yousuk Seung, "Enabling High-Bandwidth Vehicular Content Distribution," in *Proceedings of the 6th International Conference on emerging Networking EXperiments and Technologies (CoNEXT 2010)*, Philadelphia, Pennsylvania, USA, November 30 – December 3, 2010.
10. Swati Rallapalli, Lili Qiu, Yin Zhang, and Yi-Chao Chen, "Exploiting Temporal Stability and Low-Rank Structure for Localization in Mobile Networks," in *Proceedings of the 16th Annual International Conference on Mobile Computing and Networking (MobiCom 2010)*, Chicago, Illinois, USA, September 2010.
11. Ajay Mahimkar, Han Hee Song, Zihui Ge, Aman Shaikh, Jia Wang, Jennifer Yates, Yin Zhang and Joanne Emmons, "Detecting the Performance Impact of Upgrades in Large Operational Networks," in *Proceedings of the 2010 ACM SIGCOMM Conference*, New Delhi, India, August-September 2010.
12. Ye Wang, Hao Wang, Ajay Mahimkar, Richard Alimi, Yin Zhang, Lili Qiu and Yang Richard Yang, "R3: Resilient Routing Reconfiguration," in *Proceedings of the 2010 ACM SIGCOMM Conference*, New Delhi, India, August-September 2010.

13. Mikkel Thorup and Yin Zhang, "Tabulation Based 5-Universal Hashing and Linear Probing," in *Proceedings of SIAM Workshop on Algorithm Engineering and Experiments (ALENEX 2010)*, Austin, TX, USA, January 2010.
14. Han Hee Song, Tae Won Cho, Vacha Dave, Yin Zhang and Lili Qiu, "Scalable Proximity Estimation and Link Prediction in Online Social Networks," in *Proceedings of the ACM/USENIX Internet Measurement Conference (IMC '09)*, Chicago, IL, USA, November 2009.
15. Yin Zhang, Matthew Roughan, Walter Willinger and Lili Qiu, "Spatio-Temporal Compressive Sensing and Internet Traffic Matrices," in *Proceedings of the 2009 ACM SIGCOMM Conference*, Barcelona, Spain, August 2009.
16. Ajay Mahimkar, Zihui Ge, Aman Shaikh, Jia Wang, Jennifer Yates, Yin Zhang and Qi Zhao, "Towards Automated Performance Diagnosis in a Large IPTV Network," in *Proceedings of the 2009 ACM SIGCOMM Conference*, Barcelona, Spain, August 2009.
17. Tae Won Cho, Michael Rabinovich, K. K. Ramakrishnan, Divesh Srivastava and Yin Zhang, "Enabling Content Dissemination Using Efficient and Scalable Multicast," in *Proceedings of the 28th IEEE International Conference on Computer Communications (Infocom 2009)*, Rio de Janeiro, Brazil, April 2009.
18. Navendu Jain, Praveen Yalagandula, Mike Dahlin and Yin Zhang, "Self-Tuning, Bandwidth-Aware Monitoring for Dynamic Data Streams," in *Proceedings of the 25th International Conference on Data Engineering (ICDE 2009)*, Shanghai, China, March 29–April 4, 2009.
19. Ajay Mahimkar, Jennifer Yates, Yin Zhang, Aman Shaikh, Jia Wang, Zihui Ge and Cheng Tien Ee, "Troubleshooting Chronic Conditions in Large IP Networks," in *Proceedings of the ACM Conference on emerging Networking EXperiments and Technologies (CoNEXT 2008)*, Madrid, Spain, December 2008.
20. Navendu Jain, Prince Mahajan, Dmitry Kit, Praveen Yalagandula, Mike Dahlin and Yin Zhang, "Network Imprecision: A New Consistency Metric for Scalable Monitoring," in *Proceedings of the 8th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2008)*, San Diego, CA, USA, December 2008.
21. Upendra B. Shevade, Han Hee Song, Lili Qiu and Yin Zhang, "Incentive-Aware Routing in DTNs," in *Proceedings of the 16th IEEE International Conference on Network Protocols (ICNP 2008)*, Orlando, FL, USA, October 2008.
22. Matthew Roughan and Yin Zhang, "GATEway: Symbiotic Inter-Domain Traffic Engineering," in *Proceedings of the 2nd International Workshop on Game Theory in Communication Networks (GameComm 2008)*, Athens, Greece, October 2008.
23. Yi Li, Lili Qiu, Yin Zhang, Eric Rozner and Ratul Mahajan, "Predictable Performance Optimization for Wireless Networks," in *Proceedings of the 2008 ACM SIGCOMM Conference*, Seattle, WA, USA, August 2008.
24. Yi Li, Lili Qiu, Yin Zhang, Ratul Mahajan, Zifei Zhong, Gaurav Deshpande and Eric Rozner, "Effects of Interference on Wireless Mesh Networks: Pathologies and a Preliminary Solution," in *Proceedings of the 6th ACM SIGCOMM Workshop on Hot Topics in Networks (HotNets-VI)*, Atlanta, GA, USA, November 2007.
25. Navendu Jain, Dmitry Kit, Prince Mahajan, Praveen Yalagandula, Mike Dahlin and Yin Zhang, "STAR: Self-Tuning Aggregation for Scalable Monitoring," in *Proceedings of the 33rd International Conference on Very Large Data Bases (VLDB 2007)*, Vienna, Austria, September 2007.
26. Lili Qiu, Yin Zhang, Feng Wang, Mi Kyung Han and Ratul Mahajan, "A General Model of Wireless Interference:," in *Proceedings of the 13th Annual International Conference on Mobile Computing and Networking (MOBICOM 2007)*, Montreal, QC, Canada, September 2007.
27. Ajay Mahimkar, Jasraj Dange, Vitaly Shmatikov, Harrick Vin and Yin Zhang, "dFence: Transparent Network-based Denial of Service Mitigation," in *Proceedings of the 4th USENIX Symposium on Networked System Design and Implementation (NSDI 2007)*, Cambridge, Massachusetts, April 2007.
28. Yi Li, Yin Zhang, Lili Qiu and Simon Lam, "SmartTunnel: Achieving Reliability in the Internet," in *Proceedings of the 26th Annual IEEE Conference on Computer Communications (Infocom 2007)*, Anchorage, Alaska, USA, May 2007.

29. Hao Wang, Haiyong Xie, Lili Qiu, Yang Richard Yang, Yin Zhang and Albert Greenberg, "COPE: Traffic Engineering in Dynamic Networks," in *Proceedings of the 2006 ACM SIGCOMM Conference*, Pisa, Italy, September 2006.
30. Matthew Roughan and Yin Zhang, "Privacy-Preserving Performance Measurements," in *Proceedings of ACM SIGCOMM Workshop on Mining Network Data (MineNet 2006)*, Pisa, Italy, September 2006.
31. Han Hee Song, Lili Qiu and Yin Zhang, "NetQuest: A Flexible Framework for Large-Scale Network Measurement," in *Proceedings of the 2006 ACM SIGMETRICS Conference*, Saint-Malo, France, June 2006.
32. Stewart Yang, Jianping Song, Harish Rajamani, Tae Won Cho, Yin Zhang and Raymond Mooney, "Fast and Effective Worm Fingerprinting via Machine Learning," in *Proceedings of the 3rd IEEE International Conference on Autonomic Computing (ICAC 2006)* (poster), Dublin, Ireland, June 2006.
33. Robert Schweller, Zhichun Li, Yan Chen, Yan Gao, Ashish Gupta, Yin Zhang, Peter Dinda, Ming-Yang Kao and Gokhan Memik, "Reverse Hashing for High-speed Network Monitoring: Algorithms, Evaluation, and Applications," in *Proceedings of the 25th Conference on Computer Communications (Infocom 2006)*, Barcelona, Spain, April 2006.
34. Navendu Jain, Praveen Yalagandula, Mike Dahlin and Yin Zhang, "INSIGHT: A Distributed Monitoring System for Tracking Continuous Queries," *Work-in-Progress Session at SOSP 2005*, Brighton, United Kingdom, October 2005.
35. Yin Zhang, Zihui Ge, Albert Greenberg and Matthew Roughan, "Network Anomography," in *Proceedings of the Internet Measurement Conference (IMC 2005)*, Berkeley, CA, USA, October 2005.
36. Gene Moo Lee, Huiya Liu, Young Yoon and Yin Zhang, "Improving Sketch Reconstruction Accuracy Using Linear Least Squares Method," in *Proceedings of the Internet Measurement Conference (IMC 2005)*, Berkeley, CA, USA, October 2005.
37. William Fenner, Michael Rabinovich, K. K. Ramakrishnan, Divesh Srivastava and Yin Zhang, "XTreeNet: Scalable Overlay Networks for XML Content Dissemination and Querying (Synopsis)," in *Proceedings of the International Workshop on Web Content Caching and Distribution (WCW' 05)*, Sophia Antipolis, French Riviera, France, September 2005.
38. Yin Zhang and Zihui Ge, "Finding Critical Traffic Matrices," in *Proceedings of the International Conference on Dependable Systems and Networks (DSN '05)*, Yokohama, Japan June, 2005.
39. Z. Morley Mao, Lili Qiu, Jia Wang and Yin Zhang, "On AS-level Path Inference," in *Proceedings of the 2005 ACM SIGMETRICS Conference*, Banff, Canada, June 2005.
40. Yin Zhang, Sumeet Singh, Subhabrata Sen, Nick Duffield and Carsten Lund, "Online Identification of Hierarchical Heavy Hitters: Algorithms, Evaluation, and Applications," in *Proceedings of the Internet Measurement Conference (IMC 2004)*, Taormina, Sicily, Italy, October 2004.
41. Haiyong Xie, Lili Qiu, Yang Richard Yang and Yin Zhang, "On Self Adaptive Routing in Dynamic Environments," in *Proceedings of the 12th IEEE International Conference on Network Protocols (ICNP 2004)*, Berlin, Germany, October 2004.
42. David Goldenberg, Lili Qiu, Haiyong Xie, Yang Richard Yang and Yin Zhang, "Optimizing Cost and Performance for Multihoming," in *Proceedings of the 2004 ACM SIGCOMM Conference*, Portland, Oregon, USA, August 2004.
43. Mikkel Thorup and Yin Zhang, "Tabulation Based 4-Universal Hashing with Applications to Second Moment Estimation," in *Proceedings of the ACM-SIAM Symposium on Discrete Algorithms (SODA 2004)*, New Orleans, Louisiana, USA, January 2004.
44. Balachander Krishnamurthy, Subhabrata Sen, Yin Zhang and Yan Chen, "Sketch-based Change Detection: Methods, Evaluation, and Applications," in *Proceedings of the 1st ACM/USENIX Internet Measurement Conference (IMC 2003)*, Miami, Florida, USA, October 2003.
45. Matthew Roughan, Mikkel Thorup and Yin Zhang, "Traffic Engineering with Estimated Traffic Matrices," in *Proceedings of the 1st ACM/USENIX Internet Measurement Conference (IMC 2003)*, Miami, Florida, USA, October 2003.

46. Yin Zhang, Matthew Roughan, Carsten Lund and David Donoho, "An Information-Theoretic Approach to Traffic Matrix Estimation," in *Proceedings of the 2003 ACM SIGCOMM Conference*, Karlsruhe, Germany, August 2003. (Selected for fast-track publication by IEEE/ACM Transactions on Networking.)
47. Lili Qiu, Yang Richard Yang, Yin Zhang and Scott Shenker, "On Selfish Routing in Internet-like Environments," in *Proceedings of the 2003 ACM SIGCOMM Conference*, Karlsruhe, Germany, August 2003. (Selected for fast-track publication by IEEE/ACM Transactions on Networking.)
48. Yin Zhang, Matthew Roughan, Nick Duffield and Albert Greenberg, "Fast Accurate Computation of Large-Scale IP Traffic Matrices from Link Loads," in *Proceedings of the 2003 ACM SIGMETRICS Conference*, San Diego, California, USA, June 2003.
49. Matthew Roughan, Mikkel Thorup and Yin Zhang, "Performance of Estimated Traffic Matrices in Traffic Engineering," in *Proceedings of the 2003 ACM SIGMETRICS Conference* (extended abstract), San Diego, California, USA, June 2003.
50. Balachander Krishnamurthy, Craig Wills, Yin Zhang and Kashi Vishwanath, "Design, Implementation, and Evaluation of a Client Characterization Driven Web Server," in *Proceedings of the 12th International World Wide Web Conference (WWW 2003)*, Budapest, Hungary, May 2003.
51. Matthew Roughan, Albert Greenberg, Charles R. Kalmanek, Michael Rumsewicz, Jennifer Yates and Yin Zhang, "Experience in Measuring Backbone Traffic Variability: Models, Metrics, Measurements and Meaning" in *Proceedings of the 18th International Teletraffic Congress (ITC 2003)*, Berlin, Germany, September 2003.
52. Matthew Roughan, Albert Greenberg, Charles R. Kalmanek, Michael Rumsewicz, Jennifer Yates and Yin Zhang, "Experience in Measuring Backbone Traffic Variability: Models, Metrics, Measurements and Meaning" in *Proceedings of the ACM SIGCOMM Internet Measurement Workshop (IMW 2002)* (extended abstract), Marseille, France, November 2002.
53. Jennifer Rexford, Jia Wang, Zhen Xiao and Yin Zhang, "BGP Routing Stability of Popular Destinations," in *Proceedings of the ACM SIGCOMM Internet Measurement Workshop (IMW 2002)*, Marseille, France, November 2002.
54. Balachander Krishnamurthy, Craig Wills and Yin Zhang, "Preliminary Measurements on the Effect of Server Adaptation for Web Content Delivery," in *Proceedings of the ACM SIGCOMM Internet Measurement Workshop (IMW 2002)* (extended abstract), Marseille, France, November 2002.
55. Yin Zhang, Lee Breslau, Vern Paxson and Scott Shenker, "On the Characteristics and Origins of Internet Flow Rates," in *Proceedings of the 2002 ACM SIGCOMM Conference*, Pittsburgh, Pennsylvania, USA, August 2002.
56. Yin Zhang, Nick Duffield, Vern Paxson and Scott Shenker, "On the Constancy of Internet Path Properties," in *Proceedings of the ACM SIGCOMM Internet Measurement Workshop (IMW 2001)*, San Francisco, California, USA, November 2001.
57. Balachander Krishnamurthy, Craig Wills and Yin Zhang, "On the Use and Performance of Content Distribution Networks," in *Proceedings of the ACM SIGCOMM Internet Measurement Workshop (IMW 2001)*, San Francisco, California, USA, November 2001.
58. Yin Zhang and Vern Paxson, "Detecting Backdoors," in *Proceedings of the 9th USENIX Security Symposium*, Denver, Colorado, USA, August 2000. **Best Student Paper Award** recipient.
59. Yin Zhang and Vern Paxson, "Detecting Stepping Stones," in *Proceedings of the 9th USENIX Security Symposium*, Denver, Colorado, USA, August 2000.
60. Yin Zhang, Lili Qiu and Srinivasan Keshav, "Speeding Up Short Data Transfers: Theory, Architectural Support, and Simulation Results," in *Proceedings of the 10th International Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV 2000)*, Chapel Hill, North Carolina, USA, June 2000.
61. Lili Qiu, Yin Zhang and Srinivasan Keshav, "On Individual and Aggregate TCP Performance," in *Proceedings of the 7th IEEE International Conference on Network Protocols (ICNP 1999)*, Toronto, Canada, November 1999.
62. Yin Zhang and Vern Paxson, "Stepping Stone Detection," New Research Session, *ACM SIGCOMM 1999*, Boston, Massachusetts, USA, September 1999.

## PATENTS

1. Balachander Krishnamurthy, Subhabrata Sen, Yin Zhang and Yan Chen, "Method and apparatus for sketch-based detection of changes in network traffic", US Patent No. 7,751,325, July 6, 2010.
2. Kadangode Ramakrishnan, William Fenner, Michael Rabinovich, Divesh Srivastava and Yin Zhang, "Method and systems for content access and distribution," US Patent No. 7,623,534, November 24, 2009.
3. Nick Duffield, Albert Greenberg, John Klinecicz, Matthew Roughan and Yin Zhang, "Traffic Matrix Estimation Method and Apparatus," US Patent No. 7,574,506, August 11, 2009.
4. Kartikeya Chandrayana, Matthew Roughan, Subhabrata Sen and Yin Zhang, "Load Balancing Techniques for Inter-domain Traffic Engineering," US Patent No. 7,467,224, December 16, 2008.
5. Nick Duffield, Carsten Lund, Subhabrata Sen, Yin Zhang and Sumeet Singh, "Methods and Apparatus for Detection of Hierarchical Heavy Hitters," US Patent No. 7,437,385, October 14, 2008.
6. Nick Duffield, Carsten Lund, Subhabrata Sen and Yin Zhang, "Methods and Apparatus for Space Efficient Adaptive Detection of Multidimensional Hierarchical Heavy Hitters," US Patent No. 7,424,489, September 9, 2008.
7. Nick Duffield, Albert Greenberg, John Klinecicz, Matthew Roughan and Yin Zhang, "Traffic Matrix Estimation Method and Apparatus," US Patent No. 7,293,086, November 6, 2007.
8. Hong-Yi Tzeng and Yin Zhang, "Scalable Atomic Multicast," US Patent No. 6,959,323, October 25, 2005.
9. Zihui Ge, Albert Greenberg, Matthew Roughan and Yin Zhang, "Method and Apparatus for Network-level Anomaly Inference," Docket Number 2005-0201, filed in December 2005.
10. Morley Mao, Lili Qiu, Jia Wang and Yin Zhang, "A Method and Apparatus for Inferring Network Paths," Docket Number 2005-0126, filed in June 2005.
11. Balachander Krishnamurthy, Subhabrata Sen, Yin Zhang and Yan Chen, "Sketch-based Change Detection in Massive Data Streams," Docket Number 2003-0219, filed in August 2003.
12. Balachander Krishnamurthy and Yin Zhang, "P4P: Proxies for P2P Systems," Docket Number 2002-0159, filed in June 2002.

## SELECTED TALKS

The following presentations can be downloaded from <http://www.cs.utexas.edu/~yzhang/talks/>

1. "Interference-Aware Wireless Network Optimization," IPAM Workshop on New Mathematical Frontiers in Network Multi-Resolution Analysis, Los Angeles, CA, USA, November 2008.
2. "COPE: Traffic Engineering in Dynamic Networks," *ACM SIGCOMM 2006*, Pisa, Italy, September 2006.
3. "Experimental Design for Practical Network Diagnosis," *MSR EdgeNet 2006*, Snoqualmie, WA, USA, June 2006.
4. "Practical Traffic Engineering in ISP Networks," MSR Asia, Beijing, China, May 2006.
5. "Xtreenet: A Scalable Unified Overlay Network for XML Content Access and Distribution," *AT&T Labs 2006 University Collaborations Symposium*, Florham Park, NJ, USA, August 2006.
6. "Network Anomography," *ACM/USENIX Internet Measurement Conference (IMC 2005)*, Berkeley, CA, USA, October 2005.
7. "Online Detection of Hierarchical Heavy Hitters," *ACM/USENIX Internet Measurement Conference (IMC 2004)*, Taormina, Sicily, Italy, October 2004.
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Available upon request.