

# Zhi-Li Zhang

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## EDUCATION

- Ph.D*                    **Computer Science, University of Massachusetts, Amherst.** Feb. 1997.  
Thesis Title: *End-to-End Support for Statistical Quality-of-Service Guarantees in Multimedia Networks*  
Thesis Advisor: Don Towsley
- M.S.*                    **Computer Science, University of Massachusetts, Amherst.** Sept. 1992.  
Thesis Title: *Complexity of Symmetric Functions in Perceptron-Like Models*  
Thesis Advisor: David A. Mix Barrington
- B.S.*                    **Computer Science, Nanjing University, Nanjing, China.** July 1986.  
*Graduated with highest distinction.*

## RESEARCH INTERESTS

General: Computer and telecommunication networks, Internet quality of service and novel architectures, wireless networks, sensor networks, multimedia networking, peer-to-peer and distributed systems, network security.  
Current Focus: Internet inter- and intra-domain routing, wireless ad hoc routing, routing algorithms and architectures for heterogeneous networks, distributed sensor networks, resilient large-scale distributed system design, self-organizing and peer-to-peer systems, security attack detection and prevention, secure networked system design.

## WORK EXPERIENCE

- Jan '07 - Present*        **Department of Computer Science, University of Minnesota, Twin Cities**  
*Qwest Chair Professor in Telecommunications*
- Jul '06 - Present*        **Department of Computer Science, University of Minnesota, Twin Cities**  
*Full Professor*
- Jul '02 - Jul '06*        **Department of Computer Science, University of Minnesota, Twin Cities**  
*Associate Professor*
- Aug '04 - May '05*       **Dept. of EECS, University of California at Berkeley**  
*Visiting Professor*
- Jul '00 - Jul '03*        **Department of Computer Science, University of Minnesota, Twin Cities**  
*McKnight Land-Grant Professor*

Jan '97 - Jun '02      **Department of Computer Science, University of Minnesota, Twin Cities**  
*Assistant Professor*

Aug '04 - Dec '04      **University of California, Berkeley**  
*Miller Visiting Professor, Miller Institute for Basic Sciences*

Jun '02 - Aug '02      **IBM T.J. Watson Research Center**  
*Visiting Professor*

Oct '01 - May '02      **Sprint Advanced Technology Labs**  
*Visiting Professor*

Jun '01 - Jul '01      **Fujitsu Labs of America, Sunnyvale, CA**  
*Summer Visiting Professor*

Jun '00 - Jul '00      **Fujitsu Labs of America, Sunnyvale, CA**  
*Summer Visiting Professor*

Jun '99 - Jul '99      **Fujitsu Labs of America, Sunnyvale, CA**  
*Summer Visiting Professor*

Oct '99 - Jan '00      **Honeywell Technology Center, Minneapolis, MN**  
*Technical Consultant on DARPA Project "CONQUER"*

Sep '92 - Dec '96      **Computer Networking Research Group, University of Massachusetts, Amherst**  
*Research Assistant*

June '94 - Aug '94      **Department of Mathematics of System and Networks, AT&T Bell Laboratories, Murray Hill**  
*Summer Intern*

Spring '91 - Fall '96      **Computer Science Department, University of Massachusetts, Amherst**  
*Teaching Assistant and Associate*

May '91 - Aug '92      **Theoretical Computer Science Group, University of Massachusetts, Amherst**  
*Research Assistant*

March '90 - July '90      **School of Computer Science, Carnegie-Mellon University**  
*Visiting Scholar*

Sep '87 - Dec '90      **Computer Science Department, Århus University, Denmark**  
*Research Associate*

## AWARDS AND HONORS

Oct 2014      **Best Paper Award** *16th Inter. Symp. on Research in Attacks, Intrusions and Defenses (RAID'13).*

2013      **Distinguished McKnight University Professor**

2011      **IEEE Fellow**

Oct 2010      **Best Poster Paper Award, IEEE ICNP'10**

Apr 2010      **Best Paper Award, IEEE INFOCOM'10** (selected out of about 250 accepted papers, and among more than 1550 submitted papers)

2007 - Present	<b>Qwest Chair Professorship in Telecommunications</b>
2006 & 2007	<b>IBM Faculty Partnership Award</b>
2005	<b>Institute of Technology George Taylor Distinguished Research Award</b> Miller Institute for Basic Sciences, University of California, Berkeley
Fall 2004	<b>Miller Visiting Professorship</b> , Miller Institute for Basic Sciences, University of California, Berkeley
Nov 2002	<b>Best Paper Award</b> <i>IEEE International Conference on Network Protocols (ICNP'02)</i> .
2000 - 2002	<b>McKnight Land-Grant Professorship</b> Award, University of Minnesota
1998 - 2002	<b>NSF CAREER AWARD</b>
Sep 1998-Jun 2000	Preseident's Distiguated Faculty Mentor for Minority Students
Sep 1997-Jun 1998	Bush Foundation Fellowship for Teaching Excellence
May 1996	<b>Best Paper Award</b> for "Best Integration of Systems and Theory," <i>SIGMETRICS'96</i> .
Fall '93 - Spring '94	Graduate School Fellowship, University of Massachusetts at Amherst.
Fall '92 - Spring '93	Graduate School Fellowship, University of Massachusetts at Amherst.
Fall '87 - Fall '90	Four-Year Fellowship from <i>Chinese State Education Commission</i> , for studying and conducting research abroad.
January 1989	Second Prize in the provincial annual <i>Science and Technology Advancement Awards</i> of Jiangsu Province.
March 1987	Third prize, Nanjing Municipal Science Knowledge Contest.
June 1986	Outstanding Student Award, Nanjing University, China. Selected to participate in Computer Science Department Special Research Program (only three students were chosen) since junior year. Led a senior design and graduation project while a junior student. Also selected as one of five students to be admitted directly (exempted from taking national graduate entrance exams) into the Computer Science Graduate Program in Nanjing University, one of the best programs in the country. Selected as the only student to study abroad under a four-year fellowship from Chinese State Education Commission in 1996.

## RESEARCH MANUSCRIPTS/BOOKS/CHAPETERS in BOOKS

1. Baek-Young Choi\*, Zhi-Li Zhang and David Du, "*Scalable Network Monitoring in High Speed Networks*," Springer Publisher, 2011, ISBN 978-1-4614-0118-6.
2. Yu Jin\* and Zhi-Li Zhang, "Application Traffic Activity Graph Analysis," Invited Chapter in *Handbook of Optimization in Complex Networks: Communications and Social Networks* (ed. by My Thai and Panos Pardalos), Springer Publisher, 2011, ISBN:978-1461408567.
3. Zhi-Li Zhang, Hun Jeong Kang\*, Supranamaya Ranjan and Antonio Nucci, "SIP-based VoIP Traffic Behavior Profiling and its Applications," Invited Chapter in *VoIP Handbook: Applications, Technologies,*

*Reliability, and Security* (ed. by Syed Ahson and Mohammad Ilyas), CRC Press, December 2008.

4. Qian Zhang, Wenwu Zhu and Zhi-Li Zhang, “Multimedia Delivery over Wireless Mesh Networks,” Invited Chapter in *Adaptation Techniques in Wireless Multimedia Networks* (ed. by Wei Li and Yang Xiao), Nova Science Publishers, 2005.
5. Srihari Nelakuditi\* and Zhi-Li Zhang, *Quality-of-Service Routing: A Localized Approach*, Kluwer Publisher, 2002.

*In the above and following \* indicates current or former student author of Dr. Zhang; + indicates current or former visiting student author of Dr. Zhang.*

#### **REFEREED JOURNAL PUBLICATIONS: Published or Accepted**

1. Vijay Kuma Adhikari\*, Yang Guo, Fang Hao, Volker Hilt, Zhi-Li Zhang, Matteo Varvello, Moritz Steiner, “Measurement Study of Netflix, Hulu, and a Tale of Three CDNs.” to appear in *IEEE/ACM Transactions on Networks*. Vol. xx, Issue x, pp.xxx – xxx, 2014. DOI: 10.1109/TNET.2013.00520.
2. Yanhua Li\* and Zhi-Li Zhang, “Mutual or Unrequited Love: Identifying Stable Clusters in Social Networks with Uni- and Bi-directional Links..” Invited to submit to a Special Issue of *Internet Mathematics*.
3. Gyan Ranjan\* and Zhi-Li Zhang, “Geometry of Complex Networks and Structural Centrality.” *Physics Letter A: Statistical Mechanics and its Applications*, Volume 392, Issue 17, pp.3833 – 3845, September 2013. DOI: 10.1016/j.physa.2013.04.013.
4. Zhenhua Li<sup>+</sup>, Zhi-Li Zhang, and Yafei Dai. “Coarse-grained Cloud Synchronization Mechanism Design May Lead to Severe Traffic Overuse” *Tsinghua Science and Technology*, Volume 18, Number 2, April 2013.
5. Yanhua Li\*, Abdelaziz, and and Zhi-Li Zhang, “Trading Optimality for Scalability in Large-scale Opportunistic Routing.” *IEEE Transactions on Vehicular Technology*, Vol. 62, Issue 5, pp.2253 – 2263, 2013. DOI: 10.1109/TVT.2012.2237045.
6. Yanhua Li\* and Zhi-Li Zhang, “Random Walks and Green’s Function on Digraphs: A Framework for Estimating Wireless Transmission Costs.” *IEEE/ACM Transactions on Networks*. Vol. 21, Issue 1, pp.135 – 148, Feb. 2013. DOI: 10.1109/TNET.2012.2191158.
7. Yanhua Li\* and Zhi-Li Zhang, “Digraph Laplacian and the Degree of Asymmetry.” *Internet Mathematics*. Volume 8, Issue 4, 2012, pp.381-401. DOI: 10.1080/15427951.2012.70889
8. Ting Zhu\*, Ziguang Zhong, Tian He, and Zhi-Li Zhang, “Achieving Efficient Flooding by Utilizing Link Correlation in Wireless Sensor Networks.” *IEEE/ACM Transactions on Networks*. Vol. 21, Issue 1, pp.121 – 134, Feb. 2013. DOI: 10.1109/TNET.2012.2197689.
9. Zhenhua Li<sup>+</sup>, Yan Huang, Gang Liu, Fucheng Wang, Yunhao Liu, Zhi-Li Zhang and Yafei Dai, “Challenges, Designs and Performances of Large-scale Open-P2SP Content Distribution.” *IEEE Transactions on Parallel*

*and Distributed Systems*, vol.24, no.11, pp.2181,2191, Nov. 2013 doi: 10.1109/TPDS.2012.252.

10. Dan Li, Jiong Xhen, Chuanxiong Guo, Yunxin Liu, Jinyu Zhang, Zhi-Li Zhang and Yongguang Zhang, "IP-Geolocation Mapping for Moderately-Connected Internet Region." *IEEE Transactions on Parallel and Distributed Systems*, 24(2): 381-391, 2013.
11. Gyan Ranjan\*, Hui Zang, Zhi-Li Zhang and Jean Bolot, "Are Call Detail Records Biased for Sampling Human Mobility?" *ACM SIGMOBILE Mobile Computing and Communications Review*, Volume 16, Issue 3, July 2012, pp.33-44. DOI:10.1145/2412096.241210.
12. Yu Jin\*, Nick Duffield, Jeffrey Erman, Patrick Haffner, Subhabrata Sen, and Zhi-Li Zhang, "A Modular Machine Learning System for Flow-Level Traffic Classification in Large Networks," *ACM Transactions on Knowledge Discovery from Data*, 2012.
13. Gyan Ranjan\*, Hui Zang, Zhi-Li Zhang, and Jean Bolot "Are Call Detail Records Biased for Sampling Human Mobility?." *ACM SIGMobile Mobile Computing and Communications Review (MC2R)*, 16(3), July, 2012.
14. Ting Zhu\*, Yu Gu, Tian He, and Zhi-Li Zhang, "Achieving Long-Term Operation with a Capacitor-Driven Energy Storage and Sharing Network." *ACM Transactions on Sensor Networks*, Vol 8, Issue 4, September 2012.
15. Eric K.-W. Kwong, L. Gao, R. Guerin, and Zhi-Li Zhang, "On the Feasibility and Efficacy of Protection Routing in IP Networks." *IEEE/ACM Transactions on Networking*, March 2011, DOI: 10.1109/TNET.2011.2123916
16. Daniel Boley, Gyan Ranjan\*, and Zhi-Li Zhang, "Commute Times for a Directed Graph using an Asymmetric Laplacian." *Linear Algebra and Appl.*, 435:224242, 2011
17. Yong Liao, Lixin Gao, Roch Guerin, and Zhi-Li Zhang, "Safe Inter-domain Routing under Diverse Commercial Agreements." *IEEE/ACM Transactions on Networking*, 2010. DOI: 10.1109/TNET.2010.2049858.
18. Ting Zhu\*, Ziguo Zhong, Tian He, and Zhi-Li Zhang, "Energy-Synchronized Computing for Sustainable Sensor Networks." *Elsevier Ad Hoc Networks Journal*, 2010.
19. Ting Zhu, Ziguo Zhong, Yu Gu, Tian He, and Zhi-Li Zhang, "Feedback Control-based Energy Management for Ubiquitous Sensor Networks." *IEICE Transactions on Communications*, Special section on Fundamental Issues on Deployment of Ubiquitous Sensor Networks, 2010.
20. Sanghwan Lee\*, Sambit Sahu, Zhi-Li Zhang, and Debanjan Saha, "On Suitability of Euclidean Embedding of Host-based Network Coordinate Systems." *IEEE/ACM Transactions on Networking*, Vol, 18, Issue 1, Feb 2010, pp.27-40.
21. Kuai Xu\*, Feng Wang, Supratik Bhattacharyya, and Zhi-Li Zhang, "Real-time Behavior Profiling for Network Monitoring." *International Journal of Internet Protocol Technology (IJIPT)*, 2010.

22. Kuai Xu\*, Jaideep Chandrashekar\*, and Zhi-Li Zhang, "Principal Component Analysis of BGP Update Streams." *Journal of Communications and Networks*, 2009.
23. Abhishek Chandra, Rohini Prinja, Sourabh Jain\*, and Zhi-Li Zhang, "Co-designing the Failure Analysis and Monitoring of Large-Scale Systems." *ACM SIGMETRICS Performance Evaluation Review*, Volume 36 , Issue 2, September 2008.
24. Haldane Peterson\*, Soumya Sen, Jaideep Chandrashekar\*, Lixin Gao, Roch Guerin, Zhi-Li Zhang, "Message-Efficient Dissemination for Loop-Free Centralized Routing." *ACM Computer Communication Review*, Volume 38, Issue 3, July 2008, pp. 65-74.
25. Kuai Xu\*, Zhi-Li Zhang, and Supratik Bhattacharyya, "Internet Traffic Behavior Profiling for Network Security Monitoring." *IEEE/ACM Transactions on Networking*, Volume 16, Issue 6, Dec. 2008, pp. 1241 - 1252.
26. Zhenhai Duan\*, Jaideep Chandrashekar\*, Jeffrey Krask\*, Kuai Xu\*, and Zhi-Li Zhang, "Damping BGP Route Flaps." *Journal of Communications and Networks*. Volume 9, Number 4. December 2007, pp. 490 - 498.
27. Srihari Nelakuditi\*, Sanghwan Lee\*, Yinzhe Yu\*, Zhi-Li Zhang, and Chen-Nee Chuah, "Fast Local Rerouting for Handling Transient Link Failures." *IEEE/ACM Transactions on Networking*, Vol. 15, issue 2, April 2007.
28. Baek-Young Choi\*, Sue Moon, Zhi-Li Zhang, and Christophe Diot, "Analysis of Point-To-Point Packet Delay in an Operational Network." *Computer Networks*, Vol 51/13 pp 3812-3827, 2007.
29. Haitao Wu, Yunxin Liu, Qian Zhang, and Zhi-Li Zhang, "SoftMAC: Layer 2.5 Collaborative MAC for Multimedia Support in Multi-Hop, Wireless Networks," *IEEE Transactions on Mobile Computing*, Vol. 6, no. 1, 2007, pp. 12-25.
30. Yingfei Dong\*, Zhi-Li Zhang and David Du, "Full-Sharing: Efficient Bandwidth Scheduling for Video Streaming over Broadband Cable Networks (BCNs)," *Multimedia Tools and Applications*, Nov 2006.
31. Yingfei Dong\*, Changho Choi\*, and Zhi-Li Zhang, "LIPS: A Lightweight Permit System for Packet Source Origin Accountability." *Elsevier Journal of Computer Networks*, Vol. 50, Issue 18, 21 December 2006.
32. Zhenhai Duan\*, Zhi-Li Zhang and Yiwei Thomas Hou, "Fundamental Trade-offs in Aggregate Packet Scheduling." In *IEEE Transactions on Parallel and Distributed Computers*, 2005.
33. Konstantina Papagianaki, Nina Taft, Zhi-Li Zhang, and Christophe Diot, "Long-Term Forecasting of Internet Backbone Traffic" (invited paper). *IEEE Transactions on Neural Networks*, Special Issue on Adaptive Learning Systems in Communications Networks, 2005.
34. Vinay Rebeiro, Zhi-Li Zhang, Sue B. Moon, and Christophe Diot, "Small-Time Scaling Behaviors of Internet Backbone Traffic: An Empirical Study" *Computer Networks*, Special Issue on Long-Range Dependent Traffic, Vol. 48(3), June 2005, pp.15-334.

35. Yinfei Dong\* and Zhi-Li Zhang, "A Practical Technique to Support Controlled Quality Assurance in Video Streaming across the Internet", *Multimedia Tools and Application*, Vol.25, 2005, pp.281-304.
36. Yingfei Dong\*, Changho Choi\*, and Zhi-Li Zhang, "A Framework for Enhancing Availability between Collaborative Domains." *Journal of Microprocessors and Microsystems*, Special Issue on Secure Computing Platforms, Vol.28, 2004, pp.547-559.
37. Srihari Nelakuditi\*, Zhi-Li Zhang, and David Du, "On Selection of Paths for Multipath Routing." *Computer Networks*, Jan 2004.
38. Zhenhai Duan\*, Zhi-Li Zhang, Yiwei T. Hou, and Lixin Gao, "A Core Stateless Bandwidth Broker Architecture for Scalable Support of Guaranteed Services." *IEEE Transactions on Parallel and Distributed Computer Systems*, pp.167-182, Feb 2004.
39. Zhenhai Duan\*, Zhi-Li Zhang and Yiwei Thomas Hou, "Service Overlay Networks: SLAs, QoS and Bandwidth Provisioning." *IEEE/ACM Transactions on Networking*, pp.870 - 883, Dec 2003.
40. Lixin Gao, Zhi-Li Zhang and Don Towsley, "Proxy-Assisted Techniques for Delivering Continuous Multimedia Streams." *IEEE/ACM Transactions on Networking*, 11(6): 884-894, 2003.
41. Victor Firoiu, Jean-Yves Le Boudec, Don Towsley and Zhi-Li Zhang, "Theories and Models in Internet Quality of Services" (**invited paper**). In *Proceedings of IEEE*, Special Issue on Internet Technologies and the Convergence of Telecommunications Services, Vol. 90, No. 9, pp.1565-1591, 2002.
42. Srihari Nelakuditi\*, Zhi-Li Zhang and Rose P. Tsang, "Adaptive Proportional Routing: A Localized QoS Routing Approach." *IEEE/ACM Transactions on Networking*, Vol. 10, December, 2002.
43. Srihari Nelakuditi\*, Srivatsan Varadarajan\*, and Zhi-Li Zhang, "On Localized Control in Quality-of-Service Routing." In *IEEE Transactions on Automatic Control*, Special Issue on Control Issues in the Internet, Vol. 47, pp. 1026-1032, June 2002.
44. Srihari Nelakuditi\* and Zhi-Li Zhang, "Localized Approach to Quality-of-Service Routing." In *IEEE Communication Magazine*, Special Issue on Quality-of-Service Routing, Vol. 40, pp.66-71, June 2002.
45. Subhabrata Sen, Don Towsley, Zhi-Li Zhang and Jayanta Dey, "Optimal Multicast Smoothing of Streaming Video over an Internetwork." In *IEEE Journal on Selected Areas in Networking*, Special Issue on Internet Proxy Services, 2002.
46. Y. Thomas Hou, Zhenhai Duan\*, Zhi-Li Zhang, Takafumi Chujo, "Providing Scalable Support for Multiple QoS Guarantees: Architecture and Mechanisms." In *IEICE Transactions on Communications*, E84-B (10), Oct 2001.
47. Zhi-Li Zhang, Zhenhai Duan\*, and Y. Thomas Hou, "On Scalable Design of Bandwidth Broker," In *IEICE Transaction on Communications*, Special Issue on Internet Technology, Vol. E84-B, No. 8, Aug 2001.

48. Zhi-Li Zhang, Srihari Nelakuditi\*, Rahul Aggarwal\*, and Rose P. Tsang, "Efficient Selective Frame Discard Algorithms for Stored Video Delivery across Resource Constrained Networks." In *Journal of Real-Time Imaging*, Special Issue on Adaptive Real Time Multimedia Transmission over Packet Switching Networks, 2001
49. Zhi-Li Zhang, Zhenhai Duan\*, Y. Thomas Hou, "Virtual Time Reference System: A Unifying Scheduling Framework for Scalable Support of Guaranteed Services." *IEEE Journal on Selected Areas in Communications*, Vol. 18, No. 12, pp.2684-2695, Dec 2000.
50. Zhi-Li Zhang, Yuewei Wang, David H.C. Du, and Dongli Su, "Video Staging: A Proxy-Server-Based Approach to End-to-End Video Delivery over Wide-Area Networks," *IEEE/ACM Transaction on Networking*, Vol. 8, No. 4, pp.429-442, Aug 2000.
51. Dapeng Wu, Y. Thomas Hou, Zhi-Li Zhang, and H. Jonathan Chao, "A Framework of Node Architecture and Traffic Management Algorithms for Achieving QoS Provisioning in Integrated Services Networks." *International Journal of Parallel and Distributed Systems and Networks*, Vol. 3, No. 2, 2000.
52. Yiwei Thomas Hou, Shivendra S. Panwar, Zhi-Li Zhang, Henry Tzeng, and Ya-Qing Zhang, "On Network Bandwidth Sharing for Transporting Rate-Adaptive Packet Video Using Feedback." *International Journal of Communication Systems*, Vol. 13, No. 1, Feb. 2000.
53. Francesco Lo Presti, Zhi-Li Zhang, Jim Kurose and Don Towsley, "Source Time Scale and Optimal Buffer/Bandwidth Trade-off for Regulated Traffic in a Network Node." *IEEE/ACM Transaction on Networking*, Vol. 7, No. 4, August 1999.
54. Yingfei Dong\*, Yiwei Thomas Hou, Zhi-Li Zhang and T. Taniguchi, "A Novel Server-Based Measurement Infrastructure for Enterprise Networks." *Performance Evaluation: An International Journal*, 36-37(1999), pp.233-247.
55. Zhen Liu, Philippe Nain, Don Towsley and Zhi-Li Zhang, "Asymptotic Behavior of a Multiplexer Fed by a Long-Range Dependent Process." *Journal of Applied Probability*, Vol. 36 (1999), pp.105-118.
56. Jim D. Salehi, Zhi-Li Zhang, Jim Kurose, and Don Towsley, "Optimal Smoothing of Stored Video and its Impact on Network Resource Requirements". *IEEE/ACM Transaction on Networking*, Vol. 6, No. 4, August 1998, pp.397-410.
57. Francesco Lo Presti, Zhi-Li Zhang, Jim Kurose and Don Towsley, "Source Time Scale and Optimal Buffer/Bandwidth Trade-off for Regulated Traffic in a Network Node." *IEEE/ACM Transaction on Networking*.
58. Zhi-Li Zhang, "Large Deviations and the Generalized Processor Sharing Scheduling for a Multiple-Queue System." *Queueing Systems: Theory and Applications*, Vol 28 (1998) 4, pp.349-376.
59. Zhi-Li Zhang, "Large Deviations and the Generalized Processor Sharing Scheduling for a Two-Queue System." *Queueing Systems: Theory and Applications*, Vol. 26 (1997) 3-4, pp.229-264.



60. Zhi-Li Zhang, Zhen Liu and Don Towsley, "Closed-Form Deterministic Performance Bounds for the Generalized Processor Sharing Scheduling Discipline." *Journal of Combinatorial Optimization*, Special Issue on Scheduling, Vol. 1, No. 4, pp. 457-481, 1998.
61. Zhi-Li Zhang, Jim Kurose, Jim D. Salehi, and Don Towsley, "Smoothing, Statistical Multiplexing and Call Admission Control for Stored Video." *IEEE Journal on Selected Areas in Communication*, Special Issue on "Real-Time Video Services in Multimedia Networks", Vol. 15, No. 6, pp. 1148-1166, August 1997.
62. Zhi-Li Zhang, Zhen Liu, Jim Kurose and Don Towsley, "Call Admission Control Schemes under the Generalized Processor Sharing Scheduling." *Telecommunication Systems*, Vol. 7, No. 1-3, pp. 125-152, July 1997.
63. Zhi-Li Zhang, Don Towsley and Jim Kurose, "Statistical Analysis of the Generalized Processor Sharing Scheduling Discipline." *IEEE Journal on Selected Areas in Communications*, Vol. 13, No. 6, pp. 1071-1080, August 1995.
64. L. Fan, C. Wang and Zhi-Li Zhang. "The Design and the System Structure of IBM Code Disassembling Program ICDA". *Computer Technology*, Vol. 3, 1990 (*in Chinese*).
65. L. Fan, C. Wang and Zhi-Li Zhang, "Discussion of Some Issues in the Implementation of IBM Code Disassembler ICDA". *Computer Technology*, Vol. 1, 1990 (*in Chinese*).
66. L. Fan, C. Wang and Zhi-Li Zhang, "The Algorithm and Implementation of IBM Code Disassembler ICDA". *Journal of Nanjing University, Natural Science Edition*, Vol. 25, April, 1989 (*in Chinese*).

**REFEREED CONFERENCE/WORKSHOP PUBLICATIONS: Highly Selective (acceptance rate 25**

1. Cheng Jin\*, Abhinav Srivastava, Yu Jin\*, Zhi-Li Zhang, Lakshman, "Concise Paper: Secgras: Security Group Analysis As a Cloud Service," In *Proc. IEEE ICNP'14*, Oct 21-Oct 24, 2014, The Research Triangle Park, NC.
2. Hesham Mekky\*, Fang Hao, Sarit Mukherjee, Zhi-Li Zhang, T V Lakshman, "Application-aware Data Plane Processing in SDN," In *Proc. HotSDN14 Workshop*, co-located with *ACM SIGCOMM'14*, August 18 to 22, 2014, Chicago, IL.
3. Golshan Golnari\*, Yanhua Li\*, Zhi-Li Zhang, "What Drives the Growth of YouTube? Measuring and Analyzing the Evolution Dynamics of YouTube Video Uploads," In *Proc. SocialCom Conferences 2014 (SocialCom'14)*, May 27-31, 2014, Stanford University, CA.
4. Hesham Mekky\*, Ruben Torres, Zhi-Li Zhang, Sabyasachi Saha and Antonio Nucc, "Detecting Malicious HTTP Redirections Using Trees of User Browsing Activity," In *Proc. IEEE INFOCOM'14 main conference*, April 27 to May 2, 2014, Toronto, Canada.

5. Zhenhua Li<sup>+</sup>, Christo Wilson, Zhefu Jiang, Yao Liu, Ben Y. Zhao, Cheng Jin, Zhi-Li Zhang, and Yafei Dai, "Efficient Batched Synchronization in Dropbox-like Cloud Storage Services." In *Proc. The ACM/IFIP/USENIX Middleware Conference (Middleware'13)*, Beijing, China, Dec 9-13, 2013.
6. Nan Jiang\*, Yu Jin\*, Ann Skudlark, and Zhi-Li Zhang, "Understanding SMS Spam in a Large Cellular Network: Characteristics, Strategies and Defenses." In *Proc. The 16th International Symposium on Research in Attacks, Intrusions and Defenses (RAID'13)*, St. Lucia, October 23-25, 2013.
7. Yingying\*, Ratul Mahajan, Baskar Sridharan, and Zhi-Li Zhang, "A Provider-side View of Web Search Response Time." In *Proc. ACM SIGCOMM 2013*, Hong Kong, China, August, 2013.
8. Ning Xia, Han Hee Song, Yong Liao, Marios Iliofotou, Antonio Nucci, Zhi-Li Zhang and Aleksandar Kuzmanovic, "Mosaic: Quantifying Privacy Leakage in Mobile Networks." In *Proc. ACM SIGCOMM 2013*, Hong Kong, China, August, 2013.
9. Nan Jiang\*, Yu Jin\*, Ann Skudlark, and Zhi-Li Zhang, "Greystar: Fast and Accurate Detection of SMS Spam Numbers in Large Cellular Networks using Grey Phone Space." In *Proc. USENIX Security Conference 2013*, Washington D.C., August, 2013.
10. Nan Jiang\*, Yu Jin\*, Ann Skudlark and Zhi-Li Zhang, "Understanding SMS Spam in a Large Cellular Network" In *Proc. ACM SIGMETRICS'13* (accepted as a poster), Pittsburgh, PA, USA, Jun 17 - Jun 21, 2013.
11. Yanhua Li\*, Haiyong Xie, Yonggang Wen, and Zhi-Li Zhang, "Coordinating In-Network Caching in Content-Centric Networks: Model and AnalysisA." In *Proc. The 33rd International Conference on Distributed Computing Systems (ICDCS'13)*, Philadelphia, PA, July, 2013.
12. Yingying Chen\*, Nick Duffield, Patrick Haffner, Wen-Ling Hsu, Guy Jacobson, Yu Jin, Subhabrata Sen, Shobha Venkataraman, and Zhi-Li Zhang, "Understanding the Complexity of 3G UMTS Network Performance." In *Proc. IFIP Networking 2013 Conference*, New York, New York, May, 2013.
13. Yanhua Li\*, Wei Chen, Yajun Wang, Zhi-Li Zhang, "Influence Diffusion Dynamics and Influence Maximization in Social Networks with Friend and Foe Relationships." In *Proc. of ACM Web Search and Data Mining (WSDM'13) Conference*, Rome, Italy, Feb 5-8, 2013.
14. Nan Jiang\*, Yu Jin\*, Ann Skudlark, Wen-Ling Hsu, Guy Jacobson, Siva Prakasam, and Zhi-Li Zhang, "Isolating and Analyzing Fraud Activities in a Large Cellular Network via Voice Call Graph Analysis." In *Proc. The 10th ACM International Conference on Mobile Systems, Applications and Services (MobiSys'12)*, Low Wood Bay, Lake District, United Kingdom, Jun 24-29, 2012.
15. Zhenhua Li<sup>+</sup>, Yan Huang, Gan Liu, Fuchen Wang, Zhi-Li Zhang, and Yafei Dai, "Maximizing the Bandwidth Multiplier Effect for Hybrid Cloud-P2P Content Distribution." In *Proc. IEEE/ACM The 20th International*

*Workshop on Quality-of-Service (IWQoS'12)*, Coimbra, Portugal, Jun 4-5, 2012.

16. Yanhua Li\*, Zhi-Li Zhang and Jie Bao, "Mutual or Unrequited Love: Identifying Stable Clusters in Social Networks with Uni- and Bi-directional Links." In *Proc. 9th Workshop on Algorithms and Models for Webgraphs (WAW'12)* (published as *Lecture Notes in Computer Science (LNCS) 7327*), Dalhousie University in Halifax, Nova Scotia, Canada June 22-23, 2012.
17. Vijay Kumar Adhikari\*, Yang Guo, Fang Hao, Matteo Varvello, Volker Hilt, Moritz Steiner, and Zhi-Li Zhang, "Unreeling Netflix: Understanding and Improving Multi-CDN Movie Delivery." In *Proc. IEEE INFOCOM'12 Main Conference*, Orlando, Mar 25-30, 2012.
18. Vijay Kumar Adhikari\*, Sourabh Jain\*, Yingying Chen\*, and Zhi-Li Zhang, "Vivisecting YouTube: An Active Measurement." In *Proc. IEEE INFOCOM'12 Mini-Conference*, Orlando, Mar 25-30, 2012.
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## KEYNOTES, INVITED LECTURES OR PRESENTATIONS

- Zhi-Li Zhang, "Detecting and Analyzing Voice Frauds and SMS Spam Activities in a Large Cellular Network," Microsoft Research, Redmond, July 19, 2012
- Zhi-Li Zhang, "Measuring and Understanding Large-scale Content (Video) Delivery Systems," Technicolor Labs, Paris, France, June 22, 2012.
2. Zhi-Li Zhang, "Understanding the Complexity of 3G UMTS Network Performance: Modeling, Prediction, and Diagnosis," Invited Talk at

INTIMATE “Big Data in Digital Life” Worskhop, Paris, France, June 20-21 , 2012

3. Zhi-Li Zhang, “Measuring and Understanding Large-scale Content (Video) Delivery Systems,” Invited Keynote at IMDEA Network Workshop on “Big Data,” Madrid, Spain, June 13, 2012.
4. Zhi-Li Zhang, “Vivisecting the YouTube Video Delivery Cloud: Overall Architecture and Key Mechanisms,” Guest Lecture at University of Sevilla, Spain, May 3, 2012.
5. Zhi-Li Zhang, “Vivisecting the YouTube Video Delivery Cloud: Overall Architecture and Key Mechanisms,” Guest Lecture at University of Carlos III, Madrid, Spain, Apr 11, 2012.
6. Zhi-Li Zhang, “VIRO: Scalable and Robust Virtual-Id Routing for Future Dynamic Networks,” University of Carlos III and IMDEA Network Joint Seminar Series, Madrid, Spain, Feb 21, 2012.
7. Zhi-Li Zhang, “VIRO: Scalable and Robust Virtual-Id Routing for Future Dynamic Networks,” Huawei Innovation Labs (Futurewei), Santa Clara, CA, Jan 31, 2012.
8. Zhi-Li Zhang, “Know Your Enemy and Know Yourself: Traffic Behavior Profiling for Network Security Monitoring,” Keynote at *The 2nd International Workshop on Security and Privacy in Cloud Computing (SPCC 2011)*, co-located with *IEEE ICDCS 2011*, Minneapolis, MN, June 24, 2011.
9. Zhi-Li Zhang, “Reverse-Engineering YouTube Video Delivery Cloud,” Nokia Labs, Beijing, China, June 3, 2011.
10. Zhi-Li Zhang, “VIRO: Scalable and Robust Virtual-Id Routing for Future Dynamic Networks,” Tsinghua University, Beijing, China, June 2, 2011.
11. Zhi-Li Zhang, “Reverse-Engineering YouTube Video Delivery Cloud,” Microsof Research Asia Lab, Beijing, China, June 1, 2011.
12. Zhi-Li Zhang, “VIRO: Scalable and Robust Virtual-Id Routing for Future Dynamic Networks,” Xidian University, Xi’an, China, May 27, 2011.
13. Zhi-Li Zhang, “Mining (Massive) Network Data for Network Management and Security,” Xi’an Jiaotong University, Xi’an, China, May 25, 2011.
14. Zhi-Li Zhang, “VIRO: Scalable and Robust Virtual-Id Routing for Future Dynamic Networks,” Michigan-Shanghai Jiaotong University Joint Institute, Shanghai, China, April 15, 2011.
15. Zhi-Li Zhang, “Identifying Suspicious Activities through DNS Graph Analysis,” Narus Inc., Feb 11, 2011.
16. Zhi-Li Zhang, “Mining (Massive) Network Data for Network Management and Security,” Department of Computer Science, Nanjing University, Nanjing, China, Sep 30, 2010.
17. Zhi-Li Zhang, “Mining (Massive) Network Data for Network Management and Security,” Chinese Academy of Telecommunications Research (CATR), Beijing, China, Sep 28, 2010.

18. Zhi-Li Zhang, "YouTube Traffic Dynamics and Its Interplay with a Tier-1 ISP: An ISP Perspective," Microsoft Research, Redmond, July, 2012
19. Zhi-Li Zhang, "Internet Traffic Behavior Profiling and IP Gray Space Analysis for Detecting Suspicious Network Activities," *Workshop on Internet Tomography*, DIMACS Center, Rutgers University, 2008
20. Zhi-Li Zhang, "Internet Traffic Behavior Profiling and IP Gray Space Analysis for Detecting Suspicious Network Activities", IBM T.J. Watson Research Center, Dec 2007.
21. Zhi-Li Zhang, "Clean Slate Design for Future Internet," Microsoft Research Asia Labs, Beijing, China, Oct 2007.
22. Zhi-Li Zhang, "On Economic Viability of Future Internet Architectures," *Panel on Future Internet Design*, ICNP'07, Beijing, Oct 2007.
23. Zhi-Li Zhang, "Profiling Internet Backbone Traffic: Behavior Models, Applications and Implementation," Universidad Carlos III de Madrid, Spain April 2007.
24. Zhi-Li Zhang, "Limiting Path Exploration in BGP." International Institute of Computer Science, Berkeley, 2005.
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## CONFERENCE/WORKSHOP CHAIRS/ORGANIZING COMMITTEES

- IEEE INFOCOM'2015 Technical Program Committee Area Chair
- IEEE International Conference on Network Protocols (ICNP'14), Technical Program Committee Area Chair
- IFIP Networking 2013 conference, Technical Program Committee Co-Chair
- IEEE International Conference on Network Protocols (ICNP'13), Technical Program Committee Co-Chair
- IEEE International Conference on Distributed Computing System (ICDCS'13), Technical Program Committee Vice-Chair
- International Conference on World Wide Web (WWW'13), Co-Chair for Track on "Software Infrastructures and Their Performance, Availability and Reliability"
- Department of Energy (DoE) Workshop on Computational Modeling of Big Networks (COMBINE), Organizational Committee
- IEEE INFOCOM'2012 Technical Program Committee Area Chair
- IEEE INFOCOM'2011 Technical Program Committee Area Chair
- Steering Committee, ACM SIGMETRICS HotMetrics Workshop (2008 - present)
- Co-Chair, ACM/USENIX Internet Measurement Conference (IMC'08), 2008
- Co-Chair, ACM SIGMETRICS First HotMetrics (HotMetrics I) Workshop, 2008
- Co-Chair, IEEE Globecom "Next Generation Networks, Protocols, and Services Symposium" (GC'08 NGNPS)
- Technical Program Committee Co-Chair, IEEE INFOCOM 2006
- Workshop Co-Chair, International Workshop on Quality-of-Service (IWQoS'04) 2004
- Steering Committee, IEEE International Workshop on Quality-of-Service
- Executive Committee, IEEE INFOCOM'2003 (the 22th Annual Joint Conference of the IEEE Computer and Communications Societies on Computer Communications).
- Executive Committee, Information Chair, IEEE INFOCOM'2001 (the 20th Annual Joint Conference of the IEEE Computer and Communications Societies on Computer Communications).
- Publicity Chair, IEEE Internet Hotconnect'2001
- Workshop Co-Chair, SPIE ITCOM'2002 Workshop on "Scalability and Traffic Control in IP Networks"
- Workshop Co-Chair, NSF ITR Workshop on "Scalable Internet QoS Solutions."

## **CONFERENCE TECHNICAL PROGRAM COMMITTEES**

- ACM Mobihoc'14, Technical Program Committee, 2014

- IFIP Networking 2014, Technical Program Committee, 2014
- IEEE ICNP'14 Technical Program Committee, 2014
- IEEE 3rd International Conference on Cloud Networking (CloudNet'14), 2014
- GobalCom'14, SAC Cloud Networks, Technical Program Committee, 2014
- 24th International Teletraffic Congress (ITC'24), Technical Program Committee, 2013
- IEEE CloudNet 2013, Technical Program Committee
- The 2nd IEEE International Workshop on Smart Data Pricing (SDP 2013), Technical Program Committee
- 1st International Workshop on Computational Social Networks(CSoNet 2013), Technical Program Committee
- ACM/USENIX Internet Measurement Conference 2012 (IMC'12) Technical Program Committee
- IEEE ICNP'2012 Technical Program Committee
- IEEE ICPP'12 Technical Program Committee
- ACM CoNext'2011 Technical Program Committee
- IEEE ICNP'2011 Technical Program Committee
- IEEE INFOCOM'2011 Technical Program Committee
- "Hot Topics Workshop on Media Delivery" (HoTMD'11) Technical Program Committee
- IEEE ICDC'2011 Technical Program Committee
- International Conference on Networked Sensing Systems (INSS 2011) Technical Program Committee
- IEEE ICNP'2010 Technical Program Committee
- ACM MobiHoc'2010 Technical Program Committee
- ACM SIGMETRICS HOTMETRICS'10 Workshop Technical Program Committee
- ITC'22 Technical Program Committee
- IEEE ICDC'2010 Technical Program Committee
- Seventh International Conference on Networked Sensing Systems (INSS'10) Technical Program Committee
- IEEE INFOCOM'2010 Technical Program Committee
- IEEE IFIP Co-NEXT 2009 Technical Program Committee
- ACM/USENIX Internet Measurement Conference 2009 (IMC'09) Technical Program Committee
- IEEE ICNP 2009 Technical Program Committee
- ACM SIGCOMM Conference 2009 Technical Program Committee
- Sixth International Conference on Networked Sensing Systems (INSS'09) Technical Program Committee

- ACM MobiHoc 2009 Technical Program Committee
- ACM SIGMETRICS HOTMETRICS'09 Workshop Technical Program Committee
- IEEE International Conference on Signal Processing and Multimedia Applications (SIGMAP'09) Technical Program Committee
- The Second International Workshop on Real Time Service-Oriented Architecture and Applications (RTSOAA'09)
- IEEE INFOCOM'2009 Technical Program Committee
- Asian Internet Engineering Conference (AINTEC) 2008 Technical Program Committee
- Third Workshop on Internet Network Management (INM'08)
- IEEE INFOCOM'2008 Technical Program Committee, Area Chair
- IEEE MMCN 2008 Technical Program Committee
- ACM MobiHoc 2008 Technical Program Committee
- ACM SIGMETRICS 2008 Technical Program Committee
- IEEE 28th International Conference on Distributed Computing Systems (ICDCS 2008)
- The First International Workshop on Real Time Service-Oriented Architecture and Applications (RTSOAA'08)
- ACM SIGCOMM Conference 2007 Technical Program Committee
- ACM SIGCOMM MineNet Workshop'07 Technical Program Committee
- ACM SIGMETRICS 2007 Technical Program Committee
- IEEE ICNP 2007 Technical Program Committee
- IEEE Global Internet 2007 Technical Program Committee
- IEEE IFIP Co-NEXT 2007 Technical Program Committee
- IEEE WoWMoM 2007 Technical Program Committee
- First Workshop on Sensor Network Architecture, Technical Program Committee
- ACM/USENIX Internet Measurement Conference 2006 Technical Program Committee
- ACM SIGCOMM MineNet Workshop'06 Technical Program Committee
- IEEE ICNP 2006 Technical Program Committee
- ACM SIGMETRICS 2006 Technical Program Committee
- IEEE WoWMoM 2006 Technical Program Committee
- International Multi-Conference on Computing in the Global Information Technology
- IEEE ICNP 2005 Technical Program Committee
- ACM SIGMETRICS 2005 Technical Program Committee
- IEEE INFOCOM 2005 Technical Program Committee

- ACM SIGCOMM MineNet Workshop'05 Technical Program Committee
- IEEE IWQoS Workshop 2005 Technical Program Committee
- IFIP Performance 2005 Technical Program Committee
- IEEE Globecom 2005 Symposium on Autonomic Internet Technical Program Committee
- ACM SIGMETRICS 2004 Technical Program Committee
- ACM SIGMM 2004 Technical Program Committee
- IEEE Pervasive Computing 2004 Technical Program Committee
- IEEE Hot Interconnect 2004 Technical Program Committee
- IEEE INFOCOM'04 Technical Program Committee
- IEEE/IFIP International Workshop on Quality of Service (IWQoS'03)
- ACM SIGMETRICS 2003
- IEEE INFOCOM'2003
- IEEE Computer and Communication Workshop 2002 (CCW'02)
- 2002 HotInterconnect Conference (HotI'02)
- 2002 IEEE High Performance Switching and Routing Conference (HPSR 2002)
- 2002 IEEE Internet Performance Symposium (IPS 2002)
- IEEE Internet Performance Symposium at Globecom 2001
- IEEE INFOCOM'2001 (the 20th Annual Joint Conference of the IEEE Computer and Communications)
- Joint ACM SIGMETRICS'2001/IFIP Performance 2001
- 2001 HotInterconnect Conference (HotI'01)
- 2001 IEEE High Performance Switching and Routing Conference 2001 (HPSR 2001)
- NOSSDAV'2001
- 2001 IEEE Internet Performance Symposium (IPS 2001)
- ACM SIGMETRICS'2000
- International Symposium on Multimedia Software Engineering (MSE-2000)
- IEEE International Conference on Distributed Computing Systems (ICDCS 2000)
- Technical Program Committee, High Speed Networks Symposium, IEEE Globecomm'2000
- Third International Workshop on Multiple Protocol Label Switching (MPLS), 2000
- Member of Technical Program Committee, IEEE INFOCOM'99 (the 18th Annual Joint Conference of the IEEE Computer and Communications Societies on Computer Communications)

- Second International Workshop on Multiple Protocol Label Switching (MPLS), 1999
- International Workshop on Group Communication (IWGC'99)
- IEEE INFOCOM'98
- Group Communication Workshop, 28th International Conference on Parallel Processing, 1998

## **JOURNAL EDITORIAL BOARDS**

- Associate Editor, *Computational Social Networks*, Springer Open Journal, 2013 - Present.
- Associate Editor, *Journal of Computer Science and Technology*, Chinese Academy of Sciences, 2009 - Present.
- Associate Editor, *IEEE/ACM Transactions on Networking*, 2001 - 2008.
- Associate Editor, *Computer Networks, an International Journal*, 2001 - 2004.

## **OTHER MAJOR INTERNAL & EXTERNAL SERVICES**

### *University and Departmental Committees:*

- Department Strategic Planning Committee (2013-2014)
- Department Evaluation Committee for Tenured Faculty (2006-2010; 2012-2014)
- Department Curriculum Committee (2012-2013)
- Department Award Committee (2010-2011)
- Department Computing Committee (2010-2011) and the Chair of the Committee from Fall 2009 - Spring 2010.  
As the Chair of the Committee, I am responsible for coordinating the meetings, conducting evaluations and leading discussions, and for finalizing the final evaluation reports.
- Digital Technology Center (DTC) ADC Fellowship Committee (2009-2010)
- Colloquium Chair (2007-2009)
- Department Strategic Planning Committee (2008-2009)
- Department Strategic Planning Committee (2006-2007)
- Department Faculty Recruiting Committee (2007-2008)
- Chair of the Research Opportunity Committee (2005-2007)
- Department Strategic Planning Committee (2006-2007)
- Chair of the DTC Chaired Professor Search Committee (2005-2007)
- Digital Technology Center (DTC) Task Force Committee, 2002-2004
- Digital Technology Center (DTC) Internal Advisory Committee, 2004-2007

### *Other External Services:*

- National Science Foundation CISE *Future Internet Design (FIND)* Programm Planning Committee, 2007-2010.
- Academic Fellowship Board, Narus Inc., 2007-Present.
- Scientific Advisory Board, Spanish IMDEA Networking Research Institute, 2007-2010
- Advisory Board of Bachelor of Information and Networking (BIN), a joint program between the University and North Hennepin Community College, 1997-1999