

# Dr. Haitao (Heather) Zheng

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## RESEARCH INTERESTS

- mmWave networking and imaging, IoT, Environmental sensing
- Dynamic spectrum access, Cognitive radios, Dynamic spectrum auctions
- Online social networks, Graph analysis and modeling
- Smartphones, Location systems

## EDUCATION

**Ph.D., University of Maryland, College Park, MD**

Electrical and Computer Engineering, July 1999, Advisor: Prof. K. J. Ray Liu

**B.S., Xi'an Jiaotong University, Xi'an, China**

Electrical Engineering, July 1995, Special Young Gifted Class

## EMPLOYMENT

<b>Professor</b> , Department of Computer Science University of California, Santa Barbara	2013.7 – present
<b>Associate Professor</b> , Department of Computer Science University of California, Santa Barbara	2009.7 – 2013.6
<b>Assistant Professor</b> , Department of Computer Science University of California, Santa Barbara	2005.8 – 2009.6
<b>Project Lead &amp; Researcher</b> , Wireless and Networking Group Microsoft Research Asia, Beijing, China	2004.3 – 2005.7
<b>Member of Technical Staff</b> , aka Researcher, Wireless Research Lab Bell-Labs, Lucent Technologies, Crawford Hill, NJ	1999.8 – 2004.2

## HONORS AND AWARDS

- **IEEE Fellow (Class of 2015)**
- Google Faculty Research Award, 2012, 2014, 2016
- Research cited by MIT Technology Review, Boston Globe, LA Times, New York Times, ComputerWorld, etc.
- **Best Practical Paper Award**, ACM Sigmetrics Conference, 2013
- **Best Paper Finalist**, ACM MobiCom Conference, 2008
- **Best Student Paper**, IEEE DySPAN Conference, 2007
- **University of California Regents Junior Faculty Fellowship**, 2007
- **Life-time Fellow of World Technology Network**, Top 5 in Communications, 2006
- **MIT Technology Review 10 Emerging Technologies**, 2006
- **MIT Technology Review TR35**, Top 35 Technology Innovators under Age of 35, 2005
- **Bell-Labs President's Gold Award**, Lucent Technologies, 2002
- **George Harhalakis Outstanding Graduate Student Award**, University of Maryland, 1998
- **Institute for Systems Research Fellowship**, University of Maryland, 1995-98

## PROFESSIONAL ACTIVITIES

### Recent Technical Program Committees:

- **IMC**, ACM Internet Measurement Conference, **2015, 2016, 2017**
- **HotMobile**, ACM Workshop on Mobile Computing Systems and Applications, **2015**

- **NSDI**, USENIX Symposium on Networked Systems Design and Implementation, **2013, 2017**
- **MobiCom**, ACM International Conference on Mobile Computing and Networking, **2009-2013, 2015, 2016, 2017**
- **WWW**, International World Wide Web Conference, **2013-2016**
- **SIGCOMM**, ACM Annual Conference of Special Interest Group on Data Communication, **2011**
- **DySPAN**, IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks, **2007- 2015**
- **MobiHoc**, ACM International Symposium on Mobile Ad Hoc Networking and Computing, **2006, 2007, 2010**
- **INFOCOM**, IEEE Conference on. Computer Communications, **2009-2011**
- **SECON**, IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks, **2006, 2007, 2008, 2009, 2010, 2011, 2013**
- **WiSec**, ACM Conference on Security and Privacy in Wireless and Mobile Networks, **2012**
- **WoWMoM**, IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks, **2010**
- **WSDR**, IEEE Workshop on Networking Technologies for Software Defined Radio (SDR) Networks, **2006, 2007, 2008**
- **CrownCOM**, International Conference on Cognitive Radio Oriented Wireless Networks and Communications, **2007, 2008**
- **WiNTECH**, The Second ACM International Workshop on Wireless Network Testbeds, Experimental evaluation and Characterization, **2007**
- **CWNets**, The First International Workshop on Cognitive Wireless Networks, **2007**
- **TAPAS**, International Workshop on Technology and Policy for Accessing Spectrum, **2006**
- **WCNC**, IEEE Wireless Communications and Networking Conference, **2006**
- **VTC**, IEEE Vehicular Technology Conference, **2006**
- **RWS**, IEEE Radio and Wireless Symposium, **2006**,
- **WiSe**, ACM International Workshop on Wireless Security, **2005**
- **ICME**, IEEE International Conference on Multimedia & Expo, **2001, 2002, 2003, 2004, 2006**
- **ICC**, IEEE International Conference on Communications, **2003**
- **ICASSP**, IEEE International Conference on Acoustics, Speech, and Signal Processing, **2002**

## Conference Organization

- **Steering Committee**, ACM International Conference on Mobile Computing and Networking (MobiCom), **2017 –**
- **Track Chair**, Ubiquitous and Mobile Computing Track, International World Wide Web Conference (WWW), **2017**
- **Technical Program Committee Co-Chair**, ACM International Conference on Mobile Computing and Networking (MobiCom), **2015**
- **Technical Program Committee Co-Chair**, IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN), **2011**
- **Panel Organizer**, IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN), **2010**
- **Special Session Organizer**, IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN), **2010**
- **Workshop Co-Chair**, 4<sup>th</sup> IEEE Workshop on Networking Technologies for Software Defined Radio Networks (WSDR), **2009**
- **Technical Program Area Chair**, IEEE International Conference on Multimedia & Expo (ICME), **2004**
- **Publication Chair**, International Workshop on Multimedia Signal Processing (MMSP), **2006**
- **Special Session Organizer**, International Workshop on Multimedia Signal Processing (MMSP), **2001**

## Editorship

- **Committee Member**, SIGMOBILE Research Highlights, **2016-2018**
- **Steering Committee**, IEEE Transactions on Mobile Computing, **2013 – present**
- **Associate Editor**, IEEE Transactions on Networking, **2013.7 - present**
- **Associate Editor**, IEEE Transactions on Mobile Computing, **2008 - 2013.7**
- **Editorial Board**, Elsevier Physical Communications, **2008 – present**
- **Editor**, IEEE Transaction on Wireless Communications, **2008-2009**
- **Guest Editor**, Special issue on Cognitive radio ad hoc networks, Elsevier Ad Hoc Networks, **July 2012**
- **Lead Guest Editor**, Special Issue on Advanced Mobility Management and QoS Protocols for Mobile Internet, IEEE Journal on Selected Area on Communications (JSAC), **2004**

- **Lead Guest Editor**, Special Issue on Cross Layer Interaction for Communications, EURASIP Journal on Applied Signal Processing, 2005
- **Advisor**, Multimedia Signal Processing Technical Committee, 2005

## PUBLICATIONS

### Journal Articles

1. Ana Nika, Zengbin Zhang, Ben Y. Zhao and Haitao Zheng, "Towards Practical Spectrum Permits," To appear: *IEEE Transactions on Cognitive Communications and Networking (TCCN)*, 2017.
2. Tianyi Wang, Gang Wang, Bolun Wang, Divya Sambasivan, Zengbin Zhang, Xing Li, Haitao Zheng and Ben Y. Zhao, "Value and Misinformation in Collaborative Investing Platforms," To appear: *ACM Transactions on the Web (TWEB)*, 2017.
3. Qingyun Liu, Xiaohan Zhao, Walter Willinger, Xiao Wang, Ben Y. Zhao and Haitao Zheng, "Self-similarity in Social Network Dynamics," *ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS)*, vol. 2, iss. 1, November 2016
4. Tianyi Wang, Yang Chen, Yi Wang, Bolun Wang, Gang Wang, Xing Li, Haitao Zheng, Ben Y. Zhao, "The Power of Comments: Fostering Social Interactions in Microblog Networks," *Frontiers of Computer Science*, vol. 10, No. 5, Pgs. 889-907, 2016
5. Ana Nika, Asad Ismail, Ben Y. Zhao, Sabrina Gaito, Gian Paolo Rossi, Haitao Zheng, "Understanding and Predicting Data Hotspots in Cellular Networks," *Mobile Networks and Applications*, vol. 21, No. 3, Pgs. 402-413, December 2015
6. Xia Zhou, Zengbin Zhang, Gang Wang, Xiaoxiao Yu, Ben Y. Zhao and Haitao Zheng, "Practical Conflict Graph in the Wild," *ACM/IEEE Transactions on Networking (ToN)*, vol. 23, No. 3, June 2015.
7. Vinod Kone, Haitao Zheng, Ant Rowstron, Greg O'Shea and Ben Y. Zhao, "Measurement-based Design of Roadside Content Delivery Systems," *IEEE Transactions on Mobile Computing (TMC)*, vol. 12, no. 6, 1160-1173, June 2013. **Featured Spotlight Paper**
8. Vinod Kone, Lei Yang, Xue Yang, Ben Y. Zhao and Haitao Zheng, "The Effectiveness of Opportunistic Spectrum Access: A Measurement Study," *ACM/IEEE Transactions on Networking (ToN)*, vol. 20, iss. 6, 2005-2016, December 2012.
9. Lili Cao and Haitao Zheng, "Balancing Reliability and Utilization in Dynamic Spectrum Access," *IEEE/ACM Transaction on Networking (ToN)*, vol. 20, iss. 3, 651-661, June 2012.
10. Lei Yang, Zengbin Zhang, Wei Hou, Ben Y. Zhao, and Haitao Zheng, "Papyrus: A Software Platform for Distributed Dynamic Spectrum Sharing Using SDRs," *ACM Computer Communication Review (CCR)*, January 2011.
11. Krishna P. N. Puttaswamy, Haitao Zheng and Ben Y. Zhao, "Securing Structured Overlays Against Identity Attacks," *IEEE Transactions on Parallel and Distributed Systems*, vol. 20, no. 10, 1487-1498, October 2009.
12. Lili Cao and Haitao Zheng, "Understanding the Power of Distributed Coordination in Spectrum Management," *ACM/Springer Mobile Networks and Applications (MONET)*, Special Issue on Cognitive Radio Oriented Wireless Networks and Communications, vol. 13, Iss. 5, 477-497, October 2008.
13. Lei Yang, Lili Cao and Haitao Zheng, "Proactive Channel Access in Dynamic Spectrum Networks," *Elsevier Physical Communication*, Vo.1, Iss. 2, 103--111, June 2008.
14. Yan Zhu and Haitao Zheng, "Understanding the Impact of Interference on Collaborative Relays," *IEEE Transaction on Mobile Computing*, vol. 7, num. 6, 724-736, June 2008.
15. Sorabh Gandhi, Chiranjeeb Buragohain, Lili Cao, Haitao Zheng and Subhash Suri, "Towards Real-Time Dynamic Spectrum Auctions," *Computer Networks (Elsevier)*, Special Issue on Cognitive Wireless Networks, vol. 52, iss. 5, 879-897, March 2008.
16. Lili Cao and Haitao Zheng, "Distributed Rule-Regulated Spectrum Sharing," *IEEE Journal on Selected Areas in Communications (JSAC)*, Special Issue on Cognitive Radio: Theory and Applications, vol. 26, iss. 1, 130-145, January 2008.

17. Vinod Kone, Sudipto Das, Ben Y. Zhao and Haitao Zheng, "QUORUM-QUality Of service RoUting in wireless Mesh networks," *ACM/Springer Mobile Networks and Applications (MONET)*, Special Issue on Advances in Heterogeneous Networking, vol. 12, no. 5-6, 358-369, December 2007.
18. Jun Zhao, Haitao Zheng and Guanghua Yang, "Spectrum Sharing through Distributed Coordination in Dynamic Spectrum Access Networks," *Wireless Communications and Mobile Computing*, Special issue on Cognitive and software defined radio, and adaptive wireless communication systems, vol. 7, iss. 9, 1061-1075, November 2007.
19. Gayatri Swamynathan, Ben Y. Zhao, Kevin C. Almeroth and Haitao Zheng, "Globally Decoupled Reputations for Large Distributed Networks," *Advances in Multimedia*, vol. 2007, no. 1, January 2007.
20. Chunyi Peng, Haitao Zheng, Ben Y. Zhao, "Utilization and Fairness in Spectrum Assignment for Opportunistic Spectrum Access," *ACM Mobile Networks and Applications (MONET)*, vol. 11, iss. 4, 555-576, August 2006.
21. Suman Das, Thierry Klein, Kin Leung, Sayandev Mukherjee, Gee Rittenhouse, Louis Samuel, Harish Viswanathan and Haitao Zheng, "Distributed paging and registration in wireless networks," *IEEE Network Magazine*, vol. 19, no. 5, 19--25, October 2005.
22. Jie Chen, Tiejun Lv and Haitao Zheng, "Joint Cross-layer Design for Wireless QoS Content Delivery," *EURASIP Journal on Applied Signal Processing*, Special Issue on Cross Layer Interaction for Communications, vol. 2005, iss. 1, 167-182, January 2005.
23. Haitao Zheng and Harish Viswanathan, "Optimizing ARQ Performance in High Speed Downlink Systems with Scheduling," *IEEE Transactions on Wireless Communications*, vol. 4, iss. 2, 495-506, March 2005.
24. Haitao Zheng, Angel Lozano and Mohammed Haleem, "Multiple ARQ Processes for MIMO Systems," *EURASIP Journal on Applied Signal Processing*, Special Issue on MIMO Systems and Signal Processing, vol. 2004, no. 5, 772-782, May 2004.
25. Haitao Zheng and Joyce Boyce, "An Improved UDP Protocol for Video Transmission over Internet-to-Wireless Networks," *IEEE Transactions on Multimedia*, vol. 3, no. 3, 356-365, September 2001.
26. Haitao Zheng and K.J. Ray Liu, "Optimization Approaches for Delivering Multimedia Services over Digital Subscriber Lines," *IEEE Signal Processing Magazine*, vol. 17, no. 4, 44-60, July 2000.
27. Haitao Zheng and K.J. Ray. Liu, "Power Minimization for Delivering Integrated Multimedia Services Over Digital Subscriber Line," *IEEE Journal of Selected Areas in Communications*, Special Issue on Error-Resilient Image and Video Transmission, vol. 18, no. 6, 841-849, , June 2000.
28. Haitao Zheng and K.J. Ray Liu, "The Subband Modulation: A Joint Power and Rate Allocation Framework for Subband Image and Video Transmission," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 9, no. 5, 823-838, August 1999.
29. Haitao Zheng and K.J. Ray Liu, "Robust Image and Video Transmission over Spectrally Shaped Channel Using Multicarrier Modulation," *IEEE Transactions On Multimedia*, Vol. 1, No. 1, 88-103, March 1999.

### Referred Conference and Workshop Publications

30. Maryam Eslami Rasekh, Zhinus Marzi, Yanzi Zhu, Upamanyu Madhow, Haitao Zheng, "Noncoherent mmWave Path Tracking," To appear: *Proceedings of the 18th ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, Sonoma, CA, February 2017
31. Zhijing Li, Ana Nika, Xinyi Zhang, Yanzi Zhu, Yuanshun Yao, Ben Y. Zhao and Haitao Zheng, "Identifying Value in Crowdsourced Wireless Signal Measurements," To appear: *Proceedings of the 26th World Wide Web Conference (WWW)*, Perth, Australia, April 2017.
32. Yanzi Zhu, Yibo Zhu, Ana Nika, Ben Y. Zhao and Haitao Zheng, "Trimming the Smartphone Network Stack," *Proceedings of the 15th ACM Workshop on Hot Topics in Networks (HotNets)*, Atlanta, GA, November 2016.
33. Qingyun Liu, Shiliang Tang, Xinyi Zhang, Xiaohan Zhao, Ben Y. Zhao and Haitao Zheng, "Network Growth and Link Prediction Through an Empirical Lens," *Proceedings of the 16th ACM SIGCOMM Internet Measurement Conference (IMC 2016)*, Santa Monica, CA, November 2016.

34. Bolun Wang, Xinyi Zhang, Gang Wang, Haitao Zheng, Ben Y. Zhao, "Anatomy of a Personalized Livestreaming System," *Proceedings of the 16th ACM SIGCOMM Internet Measurement Conference (IMC 2016)*, Santa Monica, CA, November 2016.
35. Ana Nika, Zhijing Li, Yanzi Zhu, Yibo Zhu, Ben Y. Zhao, Xia Zhou, and Haitao Zheng, "Empirical Validation of Commodity Spectrum Monitoring," *Proceedings of ACM Conference on Embedded Networked Sensor Systems (SenSys 2016)*, Stanford, CA, November 2016.
36. Gang Wang, Sarita Y. Schoenebeck, Haitao Zheng, Ben Y. Zhao, "'Will Check-in for Badges': Understanding Bias and Misbehavior on Location-based Social Networks," *Proceedings of the 10th International AAAI Conference on Web and Social Media (ICWSM 2016)*, Cologne, Germany, May 2016.
37. Gang Wang, Bolun Wang, Tianyi Wang, Ana Nika, Haitao Zheng, Ben Y. Zhao, "Defending against Sybil Devices in Crowdsourced Mapping Services," *Proceedings of the 14th ACM International Conference on Mobile Systems, Applications, and Services (MobiSys)*, Singapore, June 2016.
38. Gang Wang, Xinyi Zhang, Shiliang Tang, Haitao Zheng, Ben Y. Zhao "Unsupervised Clickstream Clustering For User Behavior Analysis," *Proceedings of SIGCHI Conference on Human Factors in Computing Systems (CHI)*, San Jose, CA, May 2016.
39. Xiaohan Zhao, Qingyun Liu, Haitao Zheng, and Ben Y. Zhao, "Towards Graph Watermarks," *Proceedings of the 3rd ACM Conference in Online Social Networks (COSN)*, Stanford, CA, November 2015.
40. Yanzi Zhu, Yibo Zhu, Ben Y. Zhao and Haitao Zheng, "Reusing 60GHz Radios for Mobile Radar Imaging," *Proceedings of the 21st Annual International Conference on Mobile Computing and Networking (MobiCom)*, Paris, France, September 2015.
41. Yibo Zhu, Nanxi Kang, Jiabin Cao, Albert Greenberg, Guohan Lu, Ratul Mahajan, Dave Maltz, Lihua Yuan, Ming Zhang, Haitao Zheng and Ben Y. Zhao, "Packet-Level Telemetry in Large Datacenter Networks," *Proceedings of ACM SIGCOMM*, London, UK, August 2015.
42. Ana Nika, Yibo Zhu, Ning Ding, Abhilash Jindal, Y. Charlie Hu, Xia Zhou, Ben Y. Zhao and Haitao Zheng, "Energy and Performance of Smartphone Radio Bundling in Outdoor Environments," *Proceedings of the 24th International World Wide Web Conference (WWW)*, Florence, Italy, May 2015.
43. Yibo Zhu, Yanzi Zhu, Zengbin Zhang, Ben Y. Zhao, Haitao Zheng, "60GHz Mobile Imaging Radar," *Proceedings of the 16th ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, Santa Fe, NM, February 2015.
44. Gang Wang, Tianyi Wang, Bolun Wang, Divya Sambasivan, Zengbin Zhang, Haitao Zheng, Ben Y. Zhao, "Crowds on Wall Street: Extracting Value from Collaborative Investing Platforms," *Proceedings of the 18th ACM conference on Computer-Supported Cooperative Work and Social Computing (CSCW)*, Vancouver BC, Canada, March 2015.
45. Gang Wang, Bolun Wang, Tianyi Wang, Ana Nika, Haitao Zheng, Ben Y. Zhao, "Whispers in the Dark: Analysis of an Anonymous Social Network," *Proceedings of the 14th ACM SIGCOMM Internet Measurement Conference (IMC)*, Vancouver BC, Canada, November 2014.
46. Ana Nika, Zengbin Zhang, Xia Zhou, Ben Y. Zhao, Haitao Zheng, "Towards Commoditized Real-time Spectrum Monitoring," *Proceedings of the 1st ACM Workshop on Hot Topics in Wireless (HotWireless)* Maui, HI, September 2014.
47. Yibo Zhu, Xia Zhou, Zengbin Zhang, Lin Zhou, Amin Vahdat, Ben Y. Zhao, Haitao Zheng, "Cutting the Cord: A Robust Wireless Facilities Network for Data Centers," *Proceedings of the 20th Annual International Conference on Mobile Computing and Networking (MobiCom)*, Maui, HI, September 2014.
48. Yibo Zhu, Zengbin Zhang, Zhinus Marzi, Chris Nelson, Upamanyu Madhow, Ben Y. Zhao, Haitao Zheng, "Demystifying 60GHz Outdoor Picocells," *Proceedings of the 20th Annual International Conference on Mobile Computing and Networking (MobiCom)*, Maui, HI, September 2014.
49. Ana Nika, Asad Ismail, Ben Y. Zhao, Sabrina Gaito, Haitao Zheng, "Understanding Data Hotspots in Cellular Networks," *Proceedings of the 10th International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine)*, Rhodes, Greece, August 2014.
50. Gang Wang, Tianyi Wang, Haitao Zheng, Ben Y. Zhao, "Man vs. Machine: Practical Adversarial Detection of Malicious Crowdsourcing Workers," *Proceedings of the 23rd USENIX Security Symposium (Usenix Security)*, San Diego, CA, August 2014.

51. Matteo Zignani, Sabrina Gaito, Gian Paolo Rossi, Xiaohan Zhao, Haitao Zheng and Ben Y. Zhao, "Link and Triadic Closure Delay: Temporal Metrics for Social Network Dynamics," *Proceedings of the 8th AAAI International Conference on Weblogs and Social Media (ICWSM)*, Ann Arbor, MI, June 2014.
52. Xiaohan Zhao, Adelbert Chang, Atish Das Sarma, Haitao Zheng and Ben Y. Zhao, "On the Embeddability of Random Walk Distances," *Proceedings of the VLDB Endowment*, Vol. 6, No. 14. Presentation at 40th International Conference on Very Large Data Bases (VLDB/PVLDB), Hangzhou, China, September, 2014.
53. Zengbin Zhang, Lin Zhou, Xiaohan Zhao, Gang Wang, Yu Su, Miriam Metzger, Haitao Zheng and Ben Y. Zhao, "On the Validity of Geosocial Mobility Traces," *Proceedings of ACM Workshop on Hot Topics in Networks (HotNets-XII)*, College Park, MD, November 2013.
54. Gianluca Stringhini, Gang Wang, Manuel Egele, Christopher Kruegel, Giovanni Vigna, Haitao Zheng, Ben Y. Zhao, "Follow the Green: Growth and Dynamics in Twitter Follower Markets," *Proceedings of the 13th ACM SIGCOMM Internet Measurement Conference (IMC)*, Barcelona, Spain, October 2013.
55. Gang Wang, Tristan Konolige, Christo Wilson, Xiao Wang, Haitao Zheng and Ben Y. Zhao, "You are How You Click: Clickstream Analysis for Sybil Detection," *Proceedings of the 22nd USENIX Security Symposium*, Washington DC, August 2013.
56. Gang Wang, Konark Gill, Manish Mohanlal, Haitao Zheng and Ben Y. Zhao, "Wisdom in the Social Crowd: an Analysis of Quora," *Proceedings of the 22nd International World Wide Web Conference (WWW)*, Rio de Janeiro, Brazil, May 2013.
57. Xia Zhou, Zengbin Zhang, Gang Wang, Xiaoxiao Yu, Ben Y. Zhao and Haitao Zheng, "Practical Conflict Graphs for Dynamic Spectrum Distribution," *Proceedings of ACM SIGMETRICS*, Pittsburgh, PA, June 2013. **Best Practical Paper Award**
58. Gang Wang, Manish Mohanlal, Christo Wilson, Xiao Wang, Miriam Metzger, Haitao Zheng and Ben Y. Zhao, "Social Turing Tests: Crowdsourcing Sybil Detection," *Proceedings of the 20th Network & Distributed System Security Symposium (NDSS)*, San Diego, CA, February 2013.
59. Xiaohan Zhao, Alessandra Sala, Christo Wilson, Xiao Wang, Sabrina Gaito, Haitao Zheng and Ben Y. Zhao, "Multi-scale Dynamics in a Massive Online Social Network," *Proceedings of ACM SIGCOMM Internet Measurement Conference (IMC)*, Boston, MA, November 2012.
60. Sabrina Gaito, Matteo Zignani, Gian Paolo Rossi, Alessandra Sala, Xiaohan Zhao, Haitao Zheng and Ben Y. Zhao, "On the Bursty Evolution of Online Social Networks," *Proceedings of ACM KDD HotSocial Workshop*, Beijing, China, August 2012.
61. Xia Zhou, Zengbin Zhang, Yibo Zhu, Yubo Li, Saipriya Kumar, Amin Vahdat, Ben Y. Zhao and Haitao Zheng, "Mirror Mirror on the Ceiling: Flexible Wireless Links for Data Centers," *Proceedings of ACM SIGCOMM*, Helsinki, Finland, August 2012.
62. Lei Yang, Zengbin Zhang, Ben Y. Zhao, Christopher Kruegel and Haitao Zheng, "Enforcing Dynamic Spectrum Access with Spectrum Permits," *Proceedings of the 13th International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, Hilton Head Island, SC, June 2012.
63. Gang Wang, Christo Wilson, Xiaohan Zhao, Yibo Zhu, Manish Mohanlal, Haitao Zheng and Ben Y. Zhao, "Serf and Turf: Crowdturfing for Fun and Profit," *Proceedings of the 20th International World Wide Web Conference (WWW)*, Lyon, France, April 2012.
64. Weile Zhang, Xia Zhou, Lei Yang, Zengbin Zhang, Ben Y. Zhao and Haitao Zheng, "3D Beamforming for Wireless Data Centers," *Proceedings of the 10th ACM Workshop on Hot Topics in Networks (HotNets-X)*, Cambridge, MA, November 2011.
65. Alessandra Sala, Xiaohan Zhao, Christo Wilson, Haitao Zheng and Ben Y. Zhao, "Sharing Graphs using Differentially Private Graph Models," *Proceedings of the 11th Internet Measurement Conference (IMC)*, Berlin, Germany, November 2011
66. Xiaohan Zhao, Alessandra Sala, Haitao Zheng and Ben Y. Zhao, "Efficient Shortest Paths on Massive Social Graphs," *Proceedings of the 7th International Conference on Collaborative Computing: Networking, Applications and Worksharing (CollaborateCom)*, Orlando, FL, October 2011.

67. Zengbin Zhang, Xia Zhou, Weile Zhang, Yuanyang Zhang, Gang Wang, Ben Y. Zhao and Haitao Zheng, "I am the Antenna: Accurate Outdoor AP Location using Smartphones," *Proceedings of the 17th Annual International Conference on Mobile Computing and Networking (MobiCom)*, Las Vegas, NV, September 2011.
68. Lara Deek, Xia Zhou, Kevin Almeroth and Haitao Zheng, "To Preempt or Not: Tackling Bid and Time-based Cheating in Online Spectrum Auctions," *Proceedings of IEEE International Conference on Computer Communications (INFOCOM)*, Shanghai, China, April 2011.
69. Vinod Kone, Lei Yang, Xue Yang, Ben Y. Zhao and Haitao Zheng, "On the Feasibility of Effective Opportunistic Spectrum Access," *Proceedings of the 10th Internet Measurement Conference (IMC)*, Melbourne, Australia, November 2010.
70. Lei Yang, Ben Y. Zhao and Haitao Zheng, "The Spaces Between Us: Setting and Maintaining Boundaries in Wireless Spectrum Access," *Proceedings of the 16th Annual International Conference on Mobile Computing and Networking (MobiCom)*, Chicago, IL, September 2010.
71. Xia Zhou and Haitao Zheng, "Breaking Bidder Collusion in Large-Scale Spectrum Auctions," *Proceedings of the 11th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, Chicago, IL, September 2010.
72. Xiaohan Zhao, Alessandra Sala, Christo Wilson, Haitao Zheng and Ben Y. Zhao, "Orion: Shortest Path Estimation for Large Social Graphs," *Proceedings of the 3rd Workshop on Online Social Networks (WOSN)*, Boston MA, June 2010.
73. Lei Yang, Vinod Kone, Xue Yang, York Liu, Ben Y. Zhao and Haitao Zheng, "Coexistence-Aware Scheduling for System-on-a-chip Wireless Devices," *Proceedings of the IEEE Communications Society Conference on Sensor and Ad Hoc Communications and Networks (SECON)*, Boston, June 2010.
74. Lili Cao, Lei Yang and Haitao Zheng, "The Impact of Frequency-Agility on Dynamic Spectrum Sharing," *Proceedings of the IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN 2010)*, Singapore, April 2010.
75. Lili Cao, Lei Yang, Xia Zhou, Z. Zhang and Haitao Zheng, "Optimus: SINR-driven Spectrum Distribution via Constraint Transformation," *Proceedings of the IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN 2010)*, Singapore, April 2010.
76. Lei Yang, Wei Hou, Lili Cao, Ben Y. Zhao and Haitao Zheng, "Supporting Demanding Wireless Applications with Frequency-agile Radios," *Proceedings of the 7th USENIX Symposium on Networked Systems Design and Implementation (NSDI)* San Jose, CA, April 2010.
77. Alessandra Sala, Lili Cao, Christo Wilson, Robert Zablit, Haitao Zheng and Ben Y. Zhao, "Measurement-calibrated Graph Models for Social Network Experiments," *Proceedings of the World Wide Web Conference (WWW)*, Raleigh, NC, April 2010, pgs 861–870.
78. Vinod Kone, Haitao Zheng, Ant Rowstron and Ben Y. Zhao, "On Infostation Density of Vehicular Networks," *Proceedings of the 5th Annual International Wireless Internet Conference (WICON)*, Singapore, March 2010.
79. Wei Hou, Lei Yang, Lin Zhang, Xiuming Shan and Haitao Zheng, "Understanding Cross-Band Interference in Unsynchronized Spectrum Access," *Proceedings of the ACM MobiCom Workshop on Cognitive Radio Networks (CoRoNet)*, September 2009.
80. Xia Zhou and Haitao Zheng, "TRUST: A General Framework for Truthful Double Spectrum Auctions," *Proceedings of the IEEE International Conference on Computer Communications (INFOCOM)*, April 2009.
81. Shulan Feng, Haitao Zheng, Haiguang Wang, Jinnan Liu and Philipp Zhang, "Preamble Design for Non-contiguous Spectrum Usage in Cognitive Radio Networks," *Proceedings of IEEE Wireless Communications and Networking Conference (WCNC 2009)*, April 2009.
82. Lei Yang, Lili Cao, Haitao Zheng and Elizabeth Belding, "Traffic-Aware Dynamic Spectrum Access," *Proceedings of the Fourth International Wireless Internet Conference (WICON 2008)*, November 2008.
83. Lei Yang, Lili Cao and Haitao Zheng, "Physical Interference Driven Dynamic Spectrum Management," *Proceedings of IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN'08)*, Chicago, IL, October 2008.

84. Xia Zhou, Sorabh Gandi and Subhash Suri and Haitao Zheng, "eBay in the Sky: Strategy-Proof Wireless Spectrum Auctions," *Proceedings of the 14th Annual International Conference on Mobile Computing and Networking (Mobicom)*, September 2008. **Best Paper Award Finalist.**
85. Xia Zhou, Shravan Mettu, Haitao Zheng and Elizabeth Belding, "Traffic-Driven Dynamic Spectrum Auctions," *Proceedings of the third IEEE Workshop on Networking Technologies for Software Defined Radio (SDR) Networks*, June 2008.
86. Ashwin Sampath, Lei Yang, Lili Cao, Haitao Zheng and Ben Y. Zhao, "Invited Paper: High Throughput Spectrum-aware Routing for Cognitive Radio Based Ad-hoc Networks," *Proceedings of the third International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM)*, Singapore, May 2008.
87. Brett Stone-Gross, Christo Wilson, Kevin Almeroth, Elizabeth Belding, Haitao Zheng and Konstantina Papagiannaki, "Malware in IEEE 802.11 Wireless Networks," *Proceedings of the Passive and Active Measurement Conference (PAM 2008)*, April 2008.
88. Lili Cao and Haitao Zheng, "Stable and Efficient Spectrum Access in Next Generation Dynamic Spectrum Networks," *Proceedings of the 27th Conference on Computer Communications (INFOCOM)*, Phoenix, AZ, April 2008.
89. Vinod Kone, Sudipto Das, Ben Y. Zhao and Haitao Zheng, "QUORUM - QUality Of service RoUting in wireless Mesh networks," *Proceedings of International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine)*, Vancouver, Canada, August 2007.
90. Lili Cao and Haitao Zheng, "On the Efficiency and Complexity of Distributed Spectrum Allocation," *Proceedings of the 2nd International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM)*, Orlando, FL, August 2007.
91. Ashwin Sampath, Hui Dai, Haitao Zheng and Ben Y. Zhao, "Multi-channel Jamming Attacks using Cognitive Radios," *Proceedings of International Conference on Computer Communications and Networks (ICCCN)*, Honolulu, HI, August 2007.
92. Lei Yang, Lili Cao, Haitao Zheng, "Proactive Channel Access in Dynamic Spectrum Networks," *Proceedings of the 2nd International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM)*, Orlando, FL, August 2007.
93. Sorabh Gandhi, Chiranjeev Buragohain, Lili Cao, Haitao Zheng and S. Suri, "A General Framework for Wireless Spectrum Auctions," *Proceedings of IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN)*, Plenary Session, Dublin, Ireland, April, 2007. **Best Student Paper Award.**
94. Ramaya Raghavendra, Amit P. Jardosh, Elizabeth Belding and Haitao Zheng, "IPAC: IP-based Adaptive Packet Concatenation for Multihop Wireless Networks," *Proceedings of the fortieth Annual Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October-November, 2006.
95. Haitao Zheng, Junwei Shi and Lili Cao, "Group-Mobility-Aware Spectrum Management for Future Digital Battlefields," *Proceedings of Military Communications Conference (MILCOM)*, October, 2006.
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101. Haitao Zheng and Lili Cao, "Device-centric Spectrum Management," *Proceedings of IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN'05)*, Baltimore, MD, November 2005. Plenary Session.
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103. Lili Cao and Haitao Zheng, "Distributed Spectrum Allocation via Local Bargaining," *Proceedings of IEEE Communications Society Conference on Sensor and Ad Hoc Communications and Networks (SECON'05)*, Santa Clara, CA, September, 2005.
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106. Haitao Zheng, Yan Zhu, Cong Shen and Xiaodong Wang, "On the Effectiveness of Cooperative Diversity in Ad Hoc Networks: A System Level Study," *Proceedings of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'05)*, Philadelphia, PA, March 2005.
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108. Thierry E. Klein, Kin K. Leung and Haitao Zheng, "Enhanced Scheduling Algorithms for Improved TCP Performance in Wireless IP Networks," *Proceedings of IEEE Global Telecommunications Conference (Globecom)*, Dallas, TX, November 2004.
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111. Guocong Song, Ye Li, Lennard J. Cimini, Jr. and Haitao Zheng, "A Joint Channel-Aware and Queue-Aware Data Scheduling in Multiple Shared Wireless Channels," *Proceedings IEEE Wireless and Communications and Networking Conference (WCNC)*, Atlanta, GA. March 2004, pp. 1922-1927.
112. Haitao Zheng and Harish Vishvanathan, "Optimizing the ARQ performance in downlink packet data systems with scheduling," *Proceedings of IEEE International Vehicle. Technology Conference (VTC fall)*, Orlando, FL. October 2003.
113. Haitao Zheng, Gee Rittenhouse and Michael Recchione, "The Performance of Voice over IP over UMTS Down- link Shared Packet Channel under Different Delay Budgets," *Proceedings of IEEE Vehicle Technology Conference (VTC fall)*, Orlando, FL. October 2003.
114. Haitao Zheng and Harish Vishvanathan, "Optimizing TCP Performance with HARQ and Scheduler," *Proceedings of IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC2003)*, September 2003, Beijing, P.R. China.
115. Haitao Zheng, "Optimizing Wireless Multimedia via Cross Layer Design," *Proceedings of IEEE International Conference on Multimedia and Expo (ICME)*, Baltimore, Maryland, July 6-10, 2003, (invited paper).
116. Haitao Zheng and Harish Vishvanathan, "High speed downlink packet data systems with scheduling, hybrid ARQ and VoIP," *Proceedings of Wireless and Optical Communications Conference*, April 2003, Newark, NJ, (invited paper).

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120. Haitao Zheng and Jill Boyce, "Packetization Scheme for MPEG Video over Wireless," *Proceedings of IEEE Wireless and Communications and Networking Conference (WCNC)*, Chicago, IL. September 2000, no.1, pp. 191-195 (invited paper).
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125. Haitao Zheng and K.J. Ray Liu, "A New Loading Algorithm Multimedia Data Transmission Over Spectrally Shaped Channels Using Multicarrier Modulation," *Proceedings of IEEE Int'l Conference on Communications (ICC)*, Vol. 3, pp. 1678-1682, Vancouver, May 1999.
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129. Haitao Zheng and K.J. Ray Liu, "The Subband Modulation: A Combined Source Coding and Channel Modulation Scheme for Image and Video Transmission," *Proceedings of IEEE Int'l Conf. on Image Processing (ICIP)*, pp. II-132-136, Chicago, October 1998.

## Books Chapters

130. Haitao Zheng and Lili Cao, "Decentralized Spectrum Management through User Coordination," In *Cognitive Wireless Communications Networks*, Vijay Bhargava and Ekram Hossain, ed., Springer, 2007.
131. Suman Das, Thierry Klein, Harish Viswanathan, Kin Leung, Sayandev Mukherjee, Gee Rittenhouse, Louis Samuel and Haitao Zheng, "A Distributed Architecture for Future WiMAX-like Wireless IP Networks," in *WiMAX/MobileFi: Advanced Research and Technology*, Yang Xiao, ed., 2007.
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133. Haitao Zheng and K. J. Ray Liu, "Multimedia Services over Digital Subscriber Line," in *Encyclopedia of Telecommunications*, John Proakis, ed., John Wiley & Sons, Inc., 2002.

## Grants

- 2016: Google Research Gift, \$76K, 60GHz Mobile Imaging Radar, PI
- 2015-2019: NSF NeTS Large, \$2.4M, Collaborative Research: GigaNets: A Path to Experimental Research in Millimeter Wave Networking, co-PI (with PI Upamanyu Madhow)
- 2015-2018: NSF TWC Small, \$499K, User Behavior Modeling and Prediction in Anonymous Social Networks, co-PI (with PI Ben Zhao)
- 2014-2017: NSF EARS, \$750K, Crowd-based Spectrum Monitoring and Enforcement, PI (with co-PI Ben Zhao and Xia Zhou)
- 2014: Google Research Gift, \$68K, Outdoor 60GHz Picocells for High-Bandwidth Communications, PI
- 2013-2016: NSF III Small, \$499K, Analysis and Models of Social Network Structure, Growth and Dynamics, co-PI (with PI Ben Zhao)
- 2013-2016: NSF NeTS Small, \$500K, Mobile mmWaves: Addressing the Cellular Capacity Crisis with 60 GHz Picocells, co-PI (with PI Upamanyu Madhow)
- 2012-2015: NSF TWC Small, \$499K, Understanding and Defending against Crowdsourced Online Identities, co-PI (with PI Ben Zhao)
- 2012: Google Research Gift, \$68K, 3D Beamforming for Wireless Data Centers, PI
- 2012: Cisco Research Gift, \$100K, Wireless Data Centers, PI (with co-PI Ben Zhao)
- 2012-14: DARPA GRAPHS, \$2.9M, Social Network Analysis: Geometry, Dynamics and Inference for Very Large Data Sets, co-PI (with PI Ben Zhao)
- 2011-12: ARMY, \$95K, A Flexible Wireless Testbed for Bio-Inspired Mobile Ad Hoc Networks, PI (with co-PI Joao Hespanha)
- 2009: Gust Perlegos Research Gift, \$100K, co-PI (with PI Ben Zhao)
- 2009: Agilent Equipment Gift, \$99K, PI
- 2009-12: NSF NeTS Small, \$260K, A Practical and Efficient Trading Platform for Dynamic Spectrum Distribution, PI
- 2009-12: NSF NeTS Medium, \$700K, AirLab: Distributed Infrastructure for Wireless Measurements, co-PI (with PI Ben Zhao)
- 2008-11: NSF NeTS NEDG, \$290K, Dynamic Spectrum Access for Availability and Reliability, PI
- 2008-09: NSF NeTS WN, \$100K, Real-time Spectrum Auctioning through Distributed Coordination, PI (with co-PI Subhash Suri)
- 2008-11: Intel Research Gift, \$171K, Enabling Coexistence of Heterogeneous Wireless Networks, PI
- 2008: Samsung Research Gift, \$60K, Exploring the Tradeoff between Reliability and Spectrum Utilization in Next Generation Cognitive Radio Networks, PI
- 2008: Huawei Research Gift, \$75K, Testbeds for Next Generation Cognitive Radio Networks, PI
- 2007, Huawei Research Gift, \$70K, Cognitive Radio Research, PI
- 2007, Microsoft Research Gift, \$10K, PI

## Former PhD Students

1. **Lei Yang** (PhD, 2011): Intel Labs, Hillsboro, OR
2. **Lili Cao** (PhD, 2011): Apple, Cupertino, CA
3. **Vinod Kone** (PhD, 2011): Twitter → Mesos, San Francisco, CA
4. **Xia Zhou** (PhD, 2013): Tenure Track Assistant Professor in Computer Science, Dartmouth College
5. **Zengbin Zhang** (PhD, 2014): Google, Mountain View, CA
6. **Gang Wang**: (PhD, 2016): Tenure Track Assistant Professor in Computer Science, Virginia Tech, co-advised with Prof. Ben Y. Zhao
7. **Yibo Zhu**: (PhD, 2016): Microsoft Research, co-advised with Prof. Ben Y. Zhao