

Dr. Ben Yanbin Zhao

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Education: **University of California at Berkeley** **Berkeley, CA**
Ph.D. in Computer Science: advisors John Kubiatawicz and Anthony Joseph. August, 2004
M.S. in Computer Science: advisor Anthony Joseph December, 2000

Yale University **New Haven, CT**
B.S. in Computer Science May, 1997
Graduated Cum Laude and Distinction in the Major

Research Interests: Systems approaches to secure and reliable large-scale networking. Interests include computer networking algorithms, protocols and applications, mobile and wireless networking, distributed systems and operating systems. Other interests include network and system security, network modeling and simulation.

Academic Experience and Research Projects: **University of California at Santa Barbara** **Santa Barbara, CA**
Assistant Professor of Computer Science July 2004 – Present
▪ Teaching courses in *Operating Systems* and *Computer Networking* at both undergraduate and graduate levels

Research Interests: Exploring high level issues in security and deployment of overlay networks and applications. Developing mechanisms and protocols for wide-area communication to enhance stability, anonymity and resilience to attacks. Applying the principles of decentralized algorithm design to different contexts, including wireless ad-hoc and sensor networks. Measuring existing wide-area network applications and the impact of security and incentive policies on user behavior.

PeerAnt Inc. **Sunnyvale, CA**
Technical Advisory Board March 2007 – Present

Microsoft Research, UK **Cambridge, UK**
Visiting Researcher July 2007 – August 2007

University of California at Berkeley **Berkeley, CA**
Graduate Student Researcher August 1997 – June 2004
Principal architect of the Tapestry structured peer-to-peer network and founding member of the OceanStore project on highly persistent global-scale storage.

IBM Almaden Research Center **San Jose, CA**
Visiting Researcher, TSpaces Group June 1999 – June 2000

Awards:

1. ComputerWorld Magazine Top IT Innovators under 40, 2007
2. MIT Technology Review TR-35 (Top 35 Technological Innovators under Age 35), 2006
3. NSF CAREER Award: *Gaia: A Self-organizing, Self-healing Network Infrastructure*, 2005
4. Best student paper: *USENIX Conference on File and Storage Technologies (FAST)*, 2003
5. Best paper: *ACM International Workshop on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, 2001
6. Best paper: *IEEE Computer Networks*, 2001
7. U. C. Regents Fellowship, 1998
8. Cum Laude and distinction in major, Yale University, 1997
9. Tau Beta Pi, Yale University, 1996
10. Congressional Youth Scholar, 1993

Professional Activities:

Member of ACM (SIGOPS, SIGCOMM, SIGMOBILE)

Member of IEEE

Member of USENIX

Program Committees

- IEEE Annual IEEE Conference on Computer Communications (*INFOCOM*) 2009
- IEEE International Conference on Parallel and Distributed Systems (ICPADS 2008)
- IEEE Annual IEEE Conference on Computer Communications (*INFOCOM*) 2008
- IEEE International Workshop on Mobile Vehicular Networks (MoVeNet) 2007
- IEEE International Conference on Parallel and Distributed Systems (ICPADS 2007)
- IEEE International Workshop on Performance Modelling and Analysis of Communication in Wired and Wireless Networks (*PMAC-2WN*) 2007
- IEEE International Conference on Network Protocols (*ICNP*) 2007
- International Conference on Parallel and Distributed Systems (*ICPADS*) 2007
- International Workshop on Performance Modeling and Evaluation (*PMECT*) 2007
- IEEE International Workshop on Quality of Service (*IWQoS*) 2007
- IEEE International Conference on Distributed Computing Systems (*ICDCS*) 2007
- International Workshop on Dependable and Sustainable Peer-to-Peer Systems (*DAS-P2P*) 2007)
- ACM Workshop on Decentralized Resource Sharing in Mobile Computing and Networking (*MobiShare*) 2006
- ACM Workshop on Scalable Trusted Computing (*STC*) 2006
- IEEE International Conference on Network Protocols (*ICNP*) 2006
- IEEE International Workshop on Performance Modelling and Analysis of Communication in Wired and Wireless Networks (*PMAC-2WN*) 2006
- IEEE International Conference on Distributed Computing Systems (*ICDCS*) 2006
- International Workshop on Peer-to-Peer Systems (*IPTPS*) 2006
- Advanced in Peer-to-Peer Multimedia Streaming (*P2MS*) 2005
- ACM Workshop on Wireless Security (*WiSe*) 2005
- International Workshop on Applications and Economics of P2P Systems (*AEPP*) 2005
- IFIP Networking Conference 2005
- International Workshop on Peer-to-Peer Systems (*IPTPS*) 2005
- IEEE International Conference on Distributed Computing Systems (*ICDCS*) 2005
- International Workshop on Mobile Peer-to-Peer Computing (*MP2P*) 2004

Journals Edited

- Co-editor, Journal of Advances in Multimedia, Special Issue: “Towards Next-Generation Peer-to-Peer Services,” Hindawi, 2007.
- Guest Editor, Concurrency and Computation: Practice and Experience, Special Issue: “Recent Advances in Peer-to-Peer Systems and Security,” Wiley, 2007.

Other Professional Service

- Steering Committee:
 - IPTPS
- Program Co-Chair:
 - IPTPS 2006
- NSF Invited Panelist for Proposal Evaluation
 - NSF Computer Systems Research: 2005, 2006, 2007, 2008
 - NSF CyberTrust: 2005
 - NSF CAREER (Networking and Systems): 2006
 - NSF CAREER (CyberTrust): 2007
- Web chair: ICNP 2006
- Panel Chair: AEPP 2005

Consulting: Replicus Software Inc., Palo Alto, CA

January – December 2003

Netlens Inc. (Acquired by NextPage Inc.), Palo Alto, CA

2000 – 2001

Publications

Journal Publications

1. “QUORUM-QUality Of service RoUting in wireless Mesh networks.” Vinod Kone, Sudipto Das, Ben Y. Zhao and Haitao Zheng. *ACM Mobile Networks and Applications (MONET)*. In press, 2008.
2. “Globally Decoupled Reputations for Large Distributed Networks.” Gayatri Swamynathan, Ben Y. Zhao, Kevin C. Almeroth and Haitao Zheng. *Hindawi Advances in Multimedia, Special Issue on Towards Next-Generation Peer-to-Peer Services*. Vol. 2007, No. 1, 2007.
3. “Exploring the Feasibility of Proactive Reputations.” Gayatri Swamynathan, Ben Y. Zhao and Kevin C. Almeroth. *Wiley Concurrency and Computation: Practice and Experience, Special Issue on Recent Advances in Peer-to-Peer Systems and Security*. Vol. 20, No. 2, Pgs. 155-166. May 2007.
4. “Determining Model Accuracy of Network Traces.” Almudena Konrad, Ben Y. Zhao, and Anthony D. Joseph. *Elsevier Journal of Computer and System Sciences*. November 2006, Vol. 72, No. 7, Pgs. 1156-1171.
5. “Collaboration and Fairness in Opportunistic Spectrum Access.” Chunyi Peng, Haitao Zheng, and Ben Y. Zhao. *ACM Mobile Networks and Applications (MONET)*. May 2006, Vol. 11, 555-576.
6. “Tapestry: A Resilient Global-scale Overlay for Service Deployment.” Ben Y. Zhao, Ling Huang, Jeremy Stribling, Sean C. Rhea, Anthony D. Joseph, and John Kubiatiowicz. *IEEE Journal on Selected Areas in Communications (JSAC)*. January 2004, Vol. 22, No. 1, 41-53.
7. “Distributed Object Location in a Dynamic Network.” Kirsten Hildrum, John D. Kubiatiowicz, Satish Rao and Ben Y. Zhao. *Springer-Verlag Theory of Computing Systems*, March 2004, No. 37, 405-440.
8. “A Markov-Based Channel Model Algorithm for Wireless Networks.” Almudena Konrad, Ben Y. Zhao, Anthony D. Joseph and Reiner Ludwig. *ACM Baltzer Wireless Networks*, May 2003, Vol. 9, No. 3, 189-199.
9. “Maintenance-Free Global Storage in OceanStore.” Sean Rhea, Chris Wells, Patrick Eaton, Dennis Geels, Ben Zhao, Hakim Weatherspoon, and John Kubiatiowicz. *IEEE Internet Computing*, Sept/Oct 2001, Vol. 5, No. 5, 40-49.
10. “An Architecture for Secure Wide-Area Service Discovery.” Todd D. Hodes, Steven E. Czerwinski, Ben Y. Zhao, Anthony D. Joseph, Randy H. Katz. *ACM Baltzer Wireless Networks*, March 2002, Vol. 8, No. 2-3, 213-230.
11. “The Ninja Architecture for Robust Internet-Scale Systems and Services.” Steven D. Gribble, Matt Welsh et, al. *IEEE Computer Networks Special Issue on Pervasive Computing*, March 2001, Vol. 35, No. 4. Best Paper Award.
12. “ICEBERG: An Internet-core Network Architecture for Integrated Communications.” Helen J. Wang, Bhaskaran Raman, et, al. *IEEE Communications: Special Issue on IP-based Mobile Telecommunication Networks*, August 2000.

Books

13. *Future Directions in Distributed Computing*. Editors: Alex Shvartsman, Andre Schiper, Hakim Weatherspoon and Ben Y. Zhao. Springer-Verlag, LNCS 2584, 2003.

Conference and Workshop Publications

14. "Towards Reliable Reputations for Dynamic Networked Systems." Gayatri Swamynathan, Ben Y. Zhao, Kevin C. Almeroth, and S. Rao Jammalamadaka. Proceedings of *IEEE Symposium on Reliable Distributed Systems (SRDS 2008)*, Naples, Italy, October 2008.
15. "Probabilistic Failure Detection for Efficient Distributed Storage Maintenance." Jing Tian, Zhi Yang, Wei Chen, Ben Y. Zhao and Yafei Dai. Proceedings of *IEEE Symposium on Reliable Distributed Systems (SRDS 2008)*, Naples, Italy, October 2008.
16. "Can Social Networks Improve e-Commerce: a Study on Social Marketplaces." Gayatri Swamynathan, Christo Wilson, Bryce Boe, Kevin C. Almeroth and Ben Y. Zhao. Proceedings of *First Workshop on Online Social Networks (WOSN 2008)*, Seattle, WA, August 2008.
17. "High Throughput Spectrum-aware Routing for Cognitive Radio Based Ad-hoc Networks." Ashwin Sampath, Lei Yang, Lili Cao, Haitao Zheng, and Ben Y. Zhao. Proceedings of *the 3rd International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM 2008)*, Singapore, May 2008.
18. "Searching for Rare Objects using Index Replication." Krishna P. N. Puttaswamy, Alessandra Sala and Ben Y. Zhao. Proceedings of *the 27th IEEE International Conference on Computer Communications (INFOCOM)*, Phoenix, AZ, April 2008.
19. "Towards Location-aware Topology in both Unstructured and Structured P2P Systems." Tongqing Qiu, Edward Chan, Mao Ye, Guihai Chen and Ben Y. Zhao. Proceedings of *International Conference on Parallel Processing (ICPP)*, XiAn, China, September 2007.
20. "QUORUM - QUALity Of service RoUtIng in wireless Mesh networks." Vinod Kone, Sudipto Das, Ben Y. Zhao and Haitao Zheng. Proceedings of *International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine)*, Vancouver, BC, Canada, August 2007.
21. "Multi-channel Jamming Attacks using Cognitive Radios." Ashwin Sampath, Hui Dai, Haitao Zheng and Ben Y. Zhao. Proceedings of *the 16th International Conference on Computer Communications and Networks (ICCCN)*, Honolulu, HI, August 2007.
22. "Fairness Attacks in the Explicit Control Protocol." Christo Wilson, Chris Coakley and Ben Y. Zhao. Proceedings of *Fifteenth IEEE International Workshop on Quality of Service (IWQoS)*, Chicago, IL, June 2007.
23. "A Case for Unstructured Distributed Hash Tables." Krishna P. N. Puttaswamy and Ben Y. Zhao. Proceedings of *IEEE Global Internet Symposium*, Anchorage, AK, May 2007.
24. "Deploying Video-on-Demand Services on Cable Networks." Matthew Allen, Ben Y. Zhao and Rich Wolski. Proceedings of *IEEE International Conference on Distributed Computing Systems (ICDCS)*, Toronto, Canada, June 2007.
25. "An Empirical Study of Collusion Behavior in the Maze P2P File-Sharing System." Qiao Lian, Zheng Zhang, Mao Yang, Ben Y. Zhao, Yafei Dai and Xiaoming Li. Proceedings of *IEEE International Conference on Distributed Computing Systems (ICDCS)*, Toronto, Canada, June 2007.

26. "HPTP: Relieving the Tension between ISPs and P2P." Guobin Shen, Ye Wang, Yongqiang Xiong, Ben Y. Zhao and Zhi-Li Zhang. *Proceedings of the 6th International Workshop on Peer-to-Peer Systems (IPTPS)*, Bellevue, WA, February 2007.
27. "Scalable Access Control for Web Services." Gayatri Swamynathan, Tyler Close, Sujata Banerjee, Rick McGeer, Ben Y. Zhao and Kevin C. Almeroth. *Proceedings of C5*, Kyoto, Japan, January 2007.
28. "Integrated Data Location in Multihop Wireless Networks." Irfan Sheriff, Prashanth Acharya, Ashwin Sampath, Ben Y. Zhao and Elizabeth Belding. *Proceedings of IEEE/Create-Net COMSWARE*, Bangalore, India, January 2007.
29. "Increasing TCP Throughput with an Enhanced Control Plane." A. Bavier et al. *Proceedings of MILCOM*, Washington, DC, October 2006.
30. "Energy Consumption and Conservation in Mobile Peer-to-Peer Systems." Selim Gurun, Priya Nagpurkar and Ben Y. Zhao. *Proceedings of ACM MobiShare*, Los Angeles, CA, September 2006.
31. "Location Independent Compact Routing for Wireless Networks." Robert Gilbert, Kerby Johnson, Shaomei Wu, Ben Y. Zhao and Haitao Zheng. *Proceedings of ACM MobiShare*, Los Angeles, CA, September 2006.
32. "Understanding User Behavior in Large Scale Video-on-Demand Systems." Hongliang Yu, Dongdong Zheng, Ben Y. Zhao and Weimin Zheng. *Proceedings of the 1st EuroSys*, Leuven, Belgium, April 2006.
33. "Parallelizing Skyline Queries for Scalable Distribution." Ping Wu, Caijie Zhang, Ying Feng, Ben Y. Zhao, Divyakant Agrawal and Amr El Abbadi. *Proceedings of the 10th International Conference on Extending Database Technology (EDBT)*, Munich, Germany, March 2006.
34. "Exploring the Feasibility of Proactive Reputations." Gayatri Swamynathan, Ben Y. Zhao and Kevin C. Almeroth. *Proceedings of the 5th International Workshop on Peer-to-Peer Systems (IPTPS)*, Santa Barbara, CA, February 2006.
35. "Identity Theft Protection in Structured Overlays." Lakshmi Ganesh and Ben Y. Zhao. *Proceedings of the 1st Workshop on Secure Network Protocols (NPSec)*, Boston, MA, November 2005.
36. "Decoupling Service and Feedback Trust in a Peer-to-Peer Reputation System." Gayatri Swamynathan, Ben Y. Zhao and Kevin Almeroth. *Proceedings of the 1st International Workshop on Applications and Economics of Peer-to-Peer Systems (AEPP)*, Nanjing, China, November 2005.
37. "Z-Ring: Fast Prefix Routing via a Low Maintenance Membership Protocol." Wei Chen, Qiao Lian, Zheng Zhang, Shaomei Wu, and Ben Y. Zhao. *Proceedings of the 13th IEEE International Conference on Network Protocols (ICNP)*, Boston, MA, November 2005.
38. "Choosing an Accurate Network Model using Domain Analysis." Almudena Konrad, Ben Y. Zhao and Anthony D. Joseph. *Proceedings of the 1st International Workshop on Performance Modelling in Wired, Wireless, Mobile Networking and Computing*, Fukuoka, Japan, July 2005.
39. "Cashmere: Resilient Anonymous Routing." Li Zhuang, Feng Zhou, Ben Y. Zhao and Antony Rowstron. *Proceedings of the 2nd Symposium on Networked Systems Design and Implementation (NSDI)*, Boston, MA, May 2005.
40. "Impact of Neighbor Selection on Performance and Resilience of Structured P2P Networks." Byung-Gon Chun, John Kubiawicz and Ben Y. Zhao. *Proceedings of the 4th International*

Workshop on Peer-To-Peer Systems (IPTPS), Ithaca, NY. February 2005.

41. "Hybrid Overlay Structure Based on Random Walk." Ruixiong Tian, Yongqiang Xiong, Qian Zhang, Bo Li, Ben Y. Zhao and Xing Li. *Proceedings of the 4th International Workshop on Peer-To-Peer Systems (IPTPS)*, Ithaca, NY. February 2005.
42. "Deployment of a large scale peer-to-peer social network." Mao Yang, Hua Chen, Ben Y. Zhao, Yafei Dai and Zheng Zhang. *Proceedings of the 1st Workshop on Real, Large Distributed Systems (WORLDS)*, San Francisco, CA. December 2004.
43. "Rapid Mobility via Type Indirection." Ben Y. Zhao, Ling Huang, Anthony D. Joseph and John D. Kubiawicz. *Proceedings of the 3rd International Workshop on Peer-to-Peer Systems (IPTPS)*, San Diego, CA. February 2004.
44. "Exploiting Routing Redundancy via Structured Peer-to-Peer Overlays." Ben Y. Zhao, Ling Huang, Jeremy Stribling, Anthony D. Joseph and John D. Kubiawicz. *Proceedings of the 11th IEEE International Conference on Network Protocols (ICNP)*. Atlanta, GA. November 2003.
45. "Approximate Object Location and Spam Filtering on Peer-to-Peer Systems." Feng Zhou, Li Zhuang, Ben Y. Zhao, Ling Huang, Anthony Joseph, and John Kubiawicz. *Proceedings of ACM/IFIP International Conference on Middleware*, Rio de Janeiro, Brazil. June 2003.
46. "Towards a Common API for P2P Overlays." Frank Dabek, Ben Y. Zhao, Peter Druschel, Ion Stoica and John Kubiawicz. *Proceedings of 2nd International Workshop on Peer-to-Peer Systems (IPTPS)*, Berkeley, CA. February, 2003.
47. "Pond: The First OceanStore Prototype," Sean Rhea, Patrick Eaton, Dennis Geels, Hakim Weatherspoon, Ben Zhao and John Kubiawicz. *Proceedings of the 2nd USENIX Conference on File and Storage Technologies*, San Francisco, CA. April 2003. Best Student Paper Award.
48. "Distributed Object Location in a Dynamic Network." Kirsten Hildrum, John D. Kubiawicz, Satish Rao and Ben Y. Zhao. *Proceedings of the Fourteenth ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Winnipeg, Canada. August 2002.
49. "Locality-aware Mechanisms for Large-scale Networks." Ben Y. Zhao, Anthony Joseph and John Kubiawicz. *Proceedings of the First Workshop on Future Directions in Distributed Computing (FuDiCo)*, Bertinoro, Italy. June 2002.
50. "Brocade: Landmark Routing on Overlay Networks." Ben Y. Zhao, Yitao Duan, Ling Huang, Anthony D. Joseph, and John D. Kubiawicz. *Proceedings of First International Workshop on Peer-to-Peer Systems (IPTPS)*, Cambridge, MA, March 2002.
51. "A Markov-based Channel Model Algorithm for Wireless Networks." Almudena Konrad, Ben Y. Zhao, Anthony D. Joseph, Reiner Ludwig. *Proceedings of the Fourth ACM International Workshop on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, July, 2001. Best Paper Award.
52. "Bayeux: An Architecture for Scalable and Fault-tolerant Wide-Area Data Dissemination." Shelley Q. Zhuang, Ben Y. Zhao, Anthony D. Joseph, Randy H. Katz and John Kubiawicz. *Proceedings of the Eleventh International Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV)*, June, 2001.
53. "OceanStore: An Architecture for Global-scale Persistent Storage." John Kubiawicz et, al. *Proceedings of the Ninth International Conference on Architecture Support for Programming Languages and Operating Systems (ASPLOS)*, November, 2000.
54. "Flexible Internetworking of Devices and Controls." Michelle Munson, Todd Hodes, Thomas Fischer, Keung-Hae Lee, Toby Lehman, Ben Zhao. *Proceedings of IECON*, San Jose, CA,

December 1999.

55. "An Architecture for a Secure Service Discovery Service." Steven Czerwinski, Ben Y. Zhao, Todd Hodes, Anthony Joseph, Randy Katz. *Proceedings of the Fifth ACM/IEEE International Conference on Mobile Computing and Networks (MobiCom)*, Seattle, WA, August 1999.