

Research Interest Wireless Systems and Networking; Mobile Computing; Distributed Systems

Education **University of California, Santa Barbara** *Sept. 2009 - Present*
Ph.D. Candidate, Department of Computer Science
• Advisor: Prof. Heather Zheng

Tsinghua University *Sept. 2006 - Jul. 2009*
Master of Engineering, Department of Electronic Engineering
• Major: Information and Communication Engineering
• Thesis: Research on the Fairness of BitTorrent Protocol
• Advisor: Prof. Xing Li

Tsinghua University *Sept. 2002 - Jul. 2006*
Bachelor of Engineering, Department of Electronic Engineering
• Major: Information Electronics and Engineering
• Thesis: The Design and Realization of Controllable Frequency and Power Transmitter
• Supervisor: Prof. Mingsheng Zhao

Publications 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*. To appear in ACM SIGCOMM, Helsinki, Finland, Aug. 2012 (**SIGCOMM'12**).

Zengbin Zhang, David Chu, Xiaomeng Chen, Thomas Moscibroda. *SwordFight: Enabling a New Class of Phone-to-Phone Action Games on Commodity Phones*. To appear in ACM MobiSys, Low Wood Bay, Lake District, UK, Jun. 2012 (**MobiSys'12**).

Lei Yang, **Zengbin Zhang**, Ben Y. Zhao, Christopher Kruegel, Haitao Zheng. *Enforcing Dynamic Spectrum Access with Spectrum Permits*. To appear in ACM MobiHoc, Hilton Head Island, South Carolina, Jun. 2012 (**MobiHoc'12**).

Weile Zhang, Xia Zhou, Lei Yang, **Zengbin Zhang**, Ben Y. Zhao and Haitao Zheng. *3D Beamforming for Wireless Data Centers*. In Proceedings of ACM HotNets, Cambridge, MA, Nov. 2011 (**HotNets'11**).

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*. In Proceedings of ACM MobiCom, Las Vegas, NV, Sept. 2011 (**MobiCom'11**).

Lei Yang, **Zengbin Zhang**, Ben Y. Zhao and Haitao Zheng. *Papyrus: A Software Platform for Distributed Dynamic Spectrum Sharing Using SDRs*. ACM SIGCOMM Computer Communication Review (CCR), Volume 41, Issue 1, Pages 32-37, Jan. 2011.

Lili Cao, Lei Yang, Xia Zhou, **Zengbin Zhang** and Haitao Zheng. *Optimus: SINR-driven Spectrum Distribution via Constraint Transformation*. In Proceedings of IEEE DySPAN, Singapore, Apr. 2010 (**DySPAN'10**).

Zengbin Zhang, Yuan Lin, Yang Chen, Yongqiang Xiong, Jacky Shen, Hongqiang Liu, Beixing Deng and Xing Li. *Experimental Study of Broadcatching in BitTorrent*. In Proceedings of IEEE CCNC, Las Vegas, NV, Jan. 2009 (**CCNC'09**).

Posters and Demos

Zengbin Zhang, Jian Qiu, David Chu, Thomas Moscibroda. *Sword Fight with Smartphones*. Demo Session of ACM SenSys, Seattle, WA, Nov. 2011 (**Best Demo Honorable Mention**).

Lei Yang, **Zengbin Zhang**, Wei Hou, Ben Y. Zhao and Haitao Zheng. *Realizing Dynamic Spectrum Sharing for Heterogeneous Wireless Networks*. Demo Session of ACM MobiCom, Chicago, IL, Sept. 2010.

Lei Yang, Wei Hou, **Zengbin Zhang**, Ben Y. Zhao and Haitao Zheng. *Jello - Dynamic Spectrum Sharing in Digital Homes*. Demo Session of IEEE INFOCOM, San Diego, CA, Mar. 2010.

Zengbin Zhang, Yao Li, Yang Chen, Pei Cao, Beixing Deng and Xing Li. *Understand the Unfairness of Bittorrent*. Poster Session of ACM SIGCOMM, Barcelona, Spain, Aug. 2009.

Research Experience

Research Assistant

Intelligent Networking Lab

Sept. 2009 - Present

University of California, Santa Barbara

- **Augmenting Data Centers with 3D Wireless Beamforming on 60GHz**

Wireless beamforming on 60GHz is a promising method to alleviate traffic hotspots in data centers. However, existing solution is limited to only neighboring rack connections because 60GHz signal is easily blocked by small obstacles. Thus we propose 3D beamforming: by bouncing wireless signal off the ceiling, we can effectively address the blockage problem and significantly reduce interference footprint, allowing the majority of rack-to-rack transmissions to run concurrently.

- **Accurate outdoor AP location system using smartphones**

We design an online, accurate transmitter location system to ease the burden of network management. Based on an interesting observation called the *body blocking effect* on smartphones, we build an accurate system for locating WiFi APs in outdoor scenarios. Our system is implemented as an Android application. We also modify the Android WiFi driver to accelerate the location process as well as to save energy.

- **Building robust and efficient dynamic spectrum access (DSA) systems and experimenting on USRP GNU radios**

We build Papyrus, a generic platform enabling reliable, efficient, and dynamic spectrum access. Papyrus significantly reduces the complexity of developing new DSA systems by providing two fundamental DSA functions in physical layer – robust detection of usable spectrum frequency and non-contiguous frequency access.

Research Intern

Mobile and Sensing Systems Group

Mentor: Thomas Moscibroda, David Chu

Jun. 2011 - Sept. 2011

Microsoft Research Asia

- **Fast and accurate phone-to-phone ranging for mobile motion games**

Motion games among ad-hoc phone users represent a brand new class of mobile games. My work addresses a critical component of these games: real-time, precise phone-to-phone ranging, leveraging acoustic signals. Our implementation of a *sword fight* game on both Android and Windows Phone 7 shows that our scheme can fully support dynamic game motion in real-time without any external infrastructure.

Research Assistant

New Generation Network Lab

Sept. 2006 - Jul. 2009

Tsinghua University

- **Design and implementation of a locality-aware BitTorrent (BT) system**

We embed a Network Coordinate system in a BitTornado server to offer BT clients a list of their nearest neighbors, such that the p2p overlay is more efficient. We also add an RSS feed-based auto-download feature to the BT client to further improve the performance. We deploy the service in a real network. Based on the system, We also investigate the unfairness problem in the BitTorrent downloading process.

Research Intern

Wireless and Networking Group

Mentor: Yongqiang Xiong

*Apr. 2007 - Aug. 2007***Microsoft Research Asia**

- **A scalable and accurate network coordinate system**

We build an accurate and scalable network coordinate system. The system has two overlays. First it leverages a number of robust web servers available on the Internet to build a landmark layer. Then it applies a reverse GNP algorithm to compute the accurate network coordinates of any host. Each host only has to ping a small number of landmarks to obtain its own coordinates.

Honors and Awards

Microsoft Research PhD Fellowship Finalist.

2012

Science & Technology Innovation Scholarship of Tsinghua Univ.

2007 - 2008

Excellent Bachelor Thesis of Tsinghua Univ. (top 5%)

2005 - 2006

Third Academic Scholarship of Tsinghua Undergraduate, Tsinghua Univ.

2003 - 2004

Second Academic Scholarship of Tsinghua Undergraduate, Tsinghua Univ.

2002 - 2003