

Yongle Wu

- CONTACT INFORMATION
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- EDUCATION
- **University of Maryland, College Park** *Sept. 2006 ~ Dec. 2010*
Ph.D., Department of Electrical & Computer Engineering
Thesis title: "*Game-Theoretic Strategies for Dynamic Behavior in Cognitive Radio Networks*"
GPA: **4.0/4.0** Advisor: **Prof. K. J. Ray Liu**
 - **Tsinghua University, Beijing, China** *Sept. 2003 ~ July 2006*
M.S., Department of Electronic Engineering
Thesis title: "*Research and Implementation of MIMO Detectors and Precoders*"
GPA: **93/100** Advisor: **Prof. Xibin Xu**
 - **Tsinghua University, Beijing, China** *Sept. 1999 ~ July 2003*
B.S. (with highest honor), Department of Electronic Engineering
GPA: **91/100**
- SELECTED HONORS AND AWARDS
- **ECE Distinguished Dissertation Fellowship**, Department of Electrical and Computer Engineering, University of Maryland, 2011.
 - **Litton Industries Fellowship in Engineering Education**, A. James Clark School of Engineering, University of Maryland, 2010.
 - **Future Faculty Fellowship**, A. James Clark School of Engineering, University of Maryland, 2009~2010.
 - **Graduate School Fellowship**, University of Maryland, 2006~2007.
 - **Outstanding Thesis Paper**, Tsinghua University, 2006.
 - **Scholarship for Graduate Students**, Tsinghua University, 2004~2005.
 - **National Scholarship (1st rank)**, Department of Education, China, 2002.
 - **Scholarship for Excellent Students**, Tsinghua University, 1999~2001.
 - **Chih-Kung Jen Scholarship**, Education Commission, Shanxi, China, 1999.
- RESEARCH EXPERIENCE
- **Senior Systems Engineer** *Feb. 2011 ~ Present*
Qualcomm Incorporated *San Diego, CA*
 - **Graduate Research Assistant** *May 2007 ~ Dec. 2010*
University of Maryland *College Park, MD*
 - **Interim Engineering Intern** *June 2009 ~ Aug. 2009*
Qualcomm Corporate R&D *San Diego, CA*

RESEARCH
TOPICS

- **Graduate Research Assistant** *Sept. 2003 ~ June 2006*
Tsinghua University *Beijing, China*
- **Undergraduate Research Assistant** *Oct. 2002 ~ July 2003*
Tsinghua University *Beijing, China*
- **3GPP LTE Modem Design & Development** *Feb. 2011 ~ Present*
 - Investigated on key technology in 3GPP long term evolution (LTE) and MIMO-OFDM systems, including cell search, cell measurement, etc.
 - Designed novel signal processing algorithms for 3GPP LTE modems and simulated their performance.
 - Supported the development and verification of the 3GPP LTE modem on chips.
- **Secure Dynamic Spectrum Access** *Mar. 2009 ~ Dec. 2010*
 - Investigated on jamming attacks in cognitive radio networks, and proposed effective countermeasures against malicious attacks.
 - Derived the achievable information secrecy rate when primary users cooperate with secondary users to enhance secrecy against intelligent eavesdroppers.
- **Time-Reversal Communication Systems** *Sept. 2009 ~ June 2010*
 - Led the design and implementation of a real world demo to verify the time-reversal idea.
 - Wrote grant proposals to NSF with my advisor for continued research.
- **Game Theoretic Analysis of Cognitive Radio Networks** *May 2007 ~ Dec. 2009*
 - Developed efficient spectrum access schemes for cognitive radio networks.
 - Researched on competition and cooperation between selfish users by game theoretic modeling, and analyzed the equilibrium of the system.
 - Proposed cheat-proof strategies to provide selfish secondary users incentives to reveal true private information.
 - Proposed collusion-resistant strategies to eliminate collusive behavior among secondary users in a spectrum market.
- **Active Hand-in in 3GPP2 Femtocells** *June 2009 ~ Aug. 2009*
 - Understood practical channel characteristics by analyzing field measurement data.
 - Investigated their impact on the active hand-in process in femtocells.
- **Design & Implementation of a 4x4 MIMO OFDM Demo** *Oct. 2002 ~ June 2006*
 - Participated in proposals for China's Beyond 3G mobile communication systems.
 - Simulated a MIMO OFDM system as the downlink for the B3G system.
 - Implemented a MIMO OFDM receiver using FPGA, DSP, and embedded CPU.
 - Played a key role in accomplishing a demo achieving 100 Mbps over the air.
- **Study on Multi-user MIMO Downlink Precoding** *Sept. 2004 ~ Dec. 2005*
 - Developed antenna selection schemes for multi-user MIMO systems.
 - Derived precoding schemes that minimize leaking energies or system-wide MSE.

ACTIVITIES

▪ **Co-instructor**

Co-taught a graduate-level course, ENEE723 (Wireless Communication Networks), with about 25% workload, and involved in all respects of the course, such as presenting lectures, designing projects, evaluating students, and so on.

▪ **Technical Program Committee**

Member of the TPC of IEEE International Conference on Computer Communications and Networks (ICCCN), Hawaii, 2011.

▪ **Technical Reviewer**

Journals: IEEE Journal on Selected Areas in Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Signal Processing, IEEE Transactions on Information Forensics and Security, IEEE Journal of Selected Topics in Signal Processing, IEEE Transactions on Multimedia, IEEE Transactions on Vehicular Technology, IEEE Communications Magazine, Ad Hoc Networks, Computer Networks, Computer Communications, IEEE Communications Letters, IEEE Signal Processing Letters;

Conferences: Globecom, ICC, DySPAN, ICASSP, WCNC, VTC, ICCCN, PIMRC, Milcom, etc.

▪ **Teaching Fellow**

ENEE630 (Advanced Digital Signal Processing), one of the core courses for graduate students majoring in communications and signal processing.

▪ **Volunteer:** IEEE Global Communications Conference (Globecom), Washington DC, 2007.

COMPUTING SKILLS

▪ Programming: Matlab, C/C++

▪ Hardware: FPGA, DSP, Embedded CPU

JOURNALS AND MAGAZINE

[J1] **Yongle Wu**, Beibei Wang, K. J. Ray Liu, and T. Charles Clancy, "Anti-Jamming Games in Multi-Channel Cognitive Radio Networks," *IEEE Journal on Selected Areas in Communications*, vol. 30, no. 1, pp. 4-15, Jan. 2012.

[J2] Beibei Wang, **Yongle Wu**, Feng Han, Yu-Han Yang, and K. J. Ray Liu, "Green Wireless Communications: a Time-Reversal Paradigm," *IEEE Journal on Selected Areas in Communications*, vol. 29, no. 8, pp.1698-1710, Sept. 2011.

[J3] **Yongle Wu** and K. J. Ray Liu, "An Information Secrecy Game in Cognitive Radio Networks", *IEEE Trans. on Information Forensics and Security*, vol. 6, no. 3, pp.831-842, Sept. 2011.

[J4] Beibei Wang, **Yongle Wu**, K. J. Ray Liu, and T. Charles Clancy, "An Anti-Jamming Game for Cognitive Radio Networks," *IEEE Journal on Selected Areas in Communications*, vol. 29, no. 4, pp. 877-889, Apr. 2011.

[J5] Yan Chen, Beibei Wang, Wan-Yi Lin, **Yongle Wu**, and K. J. Ray Liu, "Cooperative Peer-to-Peer Streaming: An Evolutionary Game-Theoretic Approach", *IEEE Trans. on*

Circuits and Systems for Video Technology, vol. 20, no. 10, pp. 1346-1357, Oct. 2010.

[J6] Beibei Wang, **Yongle Wu**, and K. J. Ray Liu, "Game Theory for Cognitive Radio Networks: An Overview", *Computer Networks*, vol. 54, no. 14, pp. 2537-2561, Oct. 2010.

[J7] Yan Chen, **Yongle Wu**, Beibei Wang, and K. J. Ray Liu, "Spectrum Auction Games For Multimedia Streaming Over Cognitive Radio Networks", *IEEE Trans. on Communications*, vol. 58, no. 8, pp. 2381-2390, Aug. 2010.

[J8] **Yongle Wu**, Beibei Wang, K. J. Ray Liu, and T. Charles Clancy, "A Scalable Collusion-Resistant Multi-Winner Cognitive Spectrum Auction Game", *IEEE Trans. on Communications*, vol. 57, no. 12, pp. 3805-3816, Dec. 2009.

[J9] **Yongle Wu**, Beibei Wang, K. J. Ray Liu, and T. Charles Clancy, "Repeated Open Spectrum Sharing Game with Cheat-Proof Strategies", *IEEE Trans. on Wireless Communications*, vol. 8, no. 4, pp. 1922-1933, Apr. 2009.

[J10] Beibei Wang, **Yongle Wu**, Zhu Ji, K. J. Ray Liu, and T. Charles Clancy, "Game Theoretical Mechanism Design for Cognitive Radio Networks with Selfish Users", *IEEE Signal Processing Magazine*, vol. 25, no. 6, pp. 74-84, Nov. 2008.

[J11] Haibo Zheng, **Yongle Wu**, Yunzhou Li, Shidong Zhou, and Jing Wang, "Limited Feedback Precoding Scheme for Downlink Multiuser MIMO Systems", *IEICE Trans. on Communications.*, vol. E90-B, no. 3, pp. 689-692, Mar. 2007.

[J12] Jinfan Zhang, **Yongle Wu**, Shidong Zhou, and Jing Wang, "Joint Linear Transmitter and Receiver Design for the Downlink of Multiuser MIMO Systems", *IEEE Communications Letters*, vol. 9, no. 11, pp. 991-993, Nov. 2005.

[J13] Jinfan Zhang, **Yongle Wu**, Mingguang Xu, and Jing Wang, "Linear transmitter precoding design for downlink of multiuser MIMO systems", *Electronics Letters*, vol. 41, no. 14, pp. 811-813, July 2005.

CONFERENCE
PUBLICATIONS

[C1] Feng Han, Yu-Han Yang, Beibei Wang, **Yongle Wu**, and K. J. Ray Liu, "Time-Reversal Division Multiple Access in Multi-path Channels", *IEEE Global Communications Conference (Globecom)*, Houston, Dec. 2011.

[C2] **Yongle Wu**, Beibei Wang, and K. J. Ray Liu, "Optimal Defense Against Jamming Attacks in Cognitive Radio Networks using the Markov Decision Process Approach", *IEEE Global Communications Conference (Globecom)*, Miami, Dec. 2010.

[C3] Yan Chen, Beibei Wang, Wan-Yi Lin, **Yongle Wu**, and K. J. Ray Liu, "Evolutionary Games for Cooperative P2P Video Streaming", *IEEE International Conf. on Image Processing (ICIP)*, Hong Kong, Sep 2010.

[C4] Yan Chen, **Yongle Wu**, Beibei Wang, and K. J. Ray Liu, "An Auction-Based Framework for Multimedia Streaming over Cognitive Radio Networks", *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Dallas, Mar. 2010.

[C5] **Yongle Wu**, Beibei Wang, and K. J. Ray Liu, "Optimal Power Allocation Strategy Against Jamming Attacks Using the Colonel Blotto Game," *IEEE Global Communications Conference (Globecom)*, Hawaii, Dec. 2009.

- [C6] **Yongle Wu**, Beibei Wang, K. J. Ray Liu, and T. Charles Clancy, "Collusion-Resistant Multi-Winner Spectrum Auction for Cognitive Radio Networks", *IEEE Global Communications Conference (Globecom)*, New Orleans, Nov. 2008.
- [C7] **Yongle Wu**, Beibei Wang, K. J. Ray Liu, and T. Charles Clancy, "A Multi-Winner Cognitive Spectrum Auction Framework with Collusion-Resistant Mechanisms", *IEEE Symposia on New Frontiers in Dynamic Spectrum Access Networks (DySPAN)*, Chicago, Oct. 2008.
- [C8] **Yongle Wu**, Beibei Wang, and K. J. Ray Liu, "Repeated Spectrum Sharing Game with Self-Enforcing Truth-Telling Mechanism", *IEEE International Conference on Communications (ICC)*, Beijing, May 2008.
- [C9] **Yongle Wu**, Jinfan Zhang, Mingguang Xu, Shidong Zhou, and Xibin Xu, "Multiuser MIMO Downlink Precoder Design Based on the Maximal SJNR Criterion," *IEEE Global Communications Conference (Globecom)*, St. Louis, Nov. 2005.
- [C10] **Yongle Wu**, Jinfan Zhang, Shidong Zhou, and Xibin Xu, "Precoding in the Multiuser MIMO Downlink Based on Subspace Tracking Techniques", *IEEE Vehicular Technology Conference (VTC)*, Dallas, Sept. 2005.
- [C11] **Yongle Wu**, Jinfan Zhang, Haibo Zheng, Xibin Xu, and Shidong Zhou, "Receive Antenna Selection in the Downlink of Multiuser MIMO Systems", *IEEE Vehicular Technology Conference (VTC)*, Dallas, Sept. 2005.
- [C12] Jinfan Zhang, **Yongle Wu**, Shidong Zhou, Limin Xiao, and Jing Wang, "Low Complexity Transmitter Zero Forcing Algorithm for Downlink Multiuser MIMO Antenna Systems", *IEEE Vehicular Technology Conference (VTC)*, Dallas, Sept. 2005.
- [C13] Jinfan Zhang, **Yongle Wu**, Jing Gu, Shidong Zhou, and Jing Wang, "Polynomial Expansion Based Fast Iterative Multiuser Detection Algorithm For Synchronous DS-CDMA Systems", *IEEE Vehicular Technology Conference (VTC)*, Stockholm, June 2005.
- [C14] **Yongle Wu**, Jing Gu, Xibin Xu, Jian Yang, and Shidong Zhou, "Blind Multiuser Detection Based on Chebyshev Approximation", *International Conference on Signal Processing*, Beijing, Sept. 2004.

REFERENCES AVAILABLE UPON REQUEST