



Pan Liu

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# RESUME

PAN LIU

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## EDUCATION

**New Jersey Institute of Technology**, Department of Electrical and Computer Engineering  
Doctor of Philosophy, 09/2003-present  
Center for Communications and Signal Processing Research (CCSPR)  
Advisor: Yeheskel Bar-Ness, Director of CCSPR  
GPA: 4.0 Credit: 72 (till now)  
PhD Thesis: "Phase Noise and PAPR of MIMO-OFDM systems: Consequences and Solutions" (tentative)  
**Tsinghua University**, Department of Electronic Engineering  
Master of Science 06/2002  
Master Thesis: "IP Gateway for Interactive Digital TV"  
Bachelor of Engineering 06/1999

## HONORS & SCHOLARSHIPS

- PHONETEL Fellowship 2006
- University Research Award 2005
- The Pioneer Project Planning of Tsinghua, one first prize, two second prizes 1999
- Tsinghua University Electronic Design Contest, won the semi-final 1999
- The Programming Contest of Department of Electronic Engineering, second prize 1998
- Tsinghua University Art Scholarship (about Peking Opera) 1997
- Tsinghua University Athlete Scholarship (about Chess) 1996
- The Beijing Mathematics Contest for High School Students, first prize 1994
- The Juvenile International Chess Competition, Champion 1992

## RESEARCH AND WORKING EXPERIENCE

**Center for Communications and Signal Processing Research**, Research Assistant 09/2003-present

- Researched on **frequency offset** and **phase noise** mitigation in **SC-FDE** system
- Researched on **synchronization** and **channel estimation** in **WLAN** and **DVB-T** system
- Protocol analysis on **WIMAX**, **IEEE 802.11n**, **IEEE 802.16e**, **IEEE 802.20**
- Researched on **synchronization** in **cooperative** wireless network and **MC-CDMA** system
- Researched on **peak to average ratio reduction** in **MIMO-OFDM** system (Interdigital Corp. project)
- Researched on **phase noise mitigation** technique in **MIMO-OFDM** system (a patent is pending)
- Researched on **space time coding** technique for **MIMO** system
- Researched on **hybrid ARQ** scheme in fading channel with **MIMO** (Samsung project)
- Protocol analysis on **3GPP (WCDMA)** and **3GPP2 (CDMA2000)**
- Developed, analyzed, and debugged algorithms for **CDMA** wireless air interface

**Data Broadcasting System in HDTV for Ministry of Information Industry**, 07/2002-08/2003

- Leader of Tsinghua's team
- Jointly developed by Tsinghua's team and STMicroelectronics corporation

**Acquire a patent about wireless bleeper system ([announcement number]1226787)** 2000

**The Digital TV Lab**, Research Assistant

09/1999-06/2002

- Researched on the specifications of **DVB** and **ATSC**
- Researched on the algorithm of **DES** of **conditional access** system
- Designed and tested **HDTV transport stream generator**
- Researched on the **interactive CATV** and **internet network technique**, Designed **IP gateway** and **embedded systems** which process interactive information in STB

**The Image Communication Lab**, Research Assistant

09/1997-05/1999

- Designed and tested **the encoder of MPEG-2** in a **real-time transport system**
- Design of Optimized **videophone system** Over PSTN
- Researched on **algorithms and architectures of MPEG-2, JPEG, wavelet encoding**
- Researched on **algorithms of JPEG2000 and MPEG-7**

**SKILLS**

- **Languages:** C/C++ (10+ years), VB, VC 6.0, HTML, VHDL
- **Advanced programming:** windows DDK for WDM driver (in C language) and VxD driver (in assembly language), Kernel Mode Driver (like NDIS driver), DSP programming for both AD (like ADSP2116x) and TI (like TMS320C6x), FPGA programming (Xilinx)
- **Advanced tools:** Matlab, Mathematica, Protel, Xilinx, soft-ice
- **Hardware designs:** DVB-(T,C,S) and ATSC tuner, HDTV signal generator and receiver
- **Software designs:** TV Internet Browser in a embedded system based on STMicroelectronics chips
- **Databases:** SQL server, Oracle, Informix, Microsoft Access
- **Protocols:** IEEE802. 11(a,b,g,n), WIMAX, IEEE802.16e, IEEE802.20, TCP/IP, WCDMA, CDMA2000, MPEG-2, 4, 7, H.263, JPEG2000
- **Operating systems:** UNIX (Sun Solaris 9), Linux (RedHat 9, Fedora 4), and Windows XP/2000/NT/98

**PUBLICATIONS (part)**

- **P. Liu**, Jianming Zhu, and Y. Bar-Ness, "Impact of Phase Noise in MIMO-OFDM Systems," to be submitted to IEEE Trans. on Signal Processing, 2006.
- **P. Liu** and Y. Bar-Ness, "Comparing the effect of Carrier Frequency Offset on OFDM and Single-Carrier Block Transmission in AWGN Channels," accepted for publication in GLOBALCOM'06, San Francisco, CA
- **P. Liu**, S. Wu and Y. Bar-Ness, "A Phase Noise Mitigation Scheme for MIMO WLANs with Spatially Correlated and Imperfectly Estimated Channels," IEEE Commun. Lett., Vol, 10 NO. 3, Mar, 2006
- S. Wu, **P. Liu** and Y. Bar-Ness, "Phase Noise Mitigation for OFDM systems," accepted for publication in IEEE Trans. on Wireless Commun., 2006.
- **P. Liu** and Y. Bar-Ness, "BER Performance Analysis for OFDM Systems With Phase Noise," in proceeding of ICC' 06, Istanbul, Turkey, 2006

**INTERN&PART-TIME JOB**

- **Part-time job in V-shine Co. Beijing, P. R. China** 06/2000-09/2000  
Help designed the DTV Transmission system
- **Intern in China Telecom** 05/1999-09/1999  
Development about the front end of Accounting System based on Unix and Informix.

**PERSONAL**

- **President** of Chinese Students and Scholars Association (CSSA) of NJIT 2005-present
- **Committee member** of Tsinghua Alumni Association (THAA) 2005-present
- **System administrator** of CCSPR 2004-present
- **President** of Peking Opera Association of Tsinghua University 1999-2000
- **Captain** of chess team of Tsinghua University 1997-1998