

Juyul Lee

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- Current** PhD Candidate of Electrical and Computer Engineering at the University of Minnesota
- Interests** Communication and information theory for multiple-antenna and multi-user communications
- Education**
- UNIVERSITY OF MINNESOTA Minneapolis, MN
PhD student, *Electrical and Computer Engineering* 08/2004 – Present
Advisor: Nihar Jindal, GPA: 4.00/4.00
- GWANGJU INSTITUTE OF SCIENCE AND TECHNOLOGY Korea
MS degree, *Information and Communications* 03/1996 – 02/1998
Thesis: Study on Subspace-based Blind Equalization in Digital Communications
Advisor: Anders Høst-Madsen, GPA: 4.33/4.50
- HONGIK UNIVERSITY Korea
BEng degree, *Electronic Engineering* 03/1992 – 02/1996
Top graduate in the College of Engineering. GPA: 4.27/4.50 (3.89/4.00)
- Experience**
- UNIVERSITY OF MINNESOTA Minneapolis, MN
Research Assistant, *Electrical and Computer Engineering* 05/2005 – Present
- Studied power allocation/scheduling for delay constrained traffic.
 - Studied high SNR behavior for MIMO broadcast channels.
 - Quantified the performance gap between dirty paper coding and linear precoding (zero-forcing, block diagonalization).
 - Determined the optimal power allocation strategy for weighted sum rate problems.
 - Studied symmetric capacity of MIMO broadcast channels.
- ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE (ETRI) Korea
Research Engineer, *Mobile Telecommunication Research Lab.* 10/2000 – 08/2004
- Implemented a synchronizing block for a base station based on a specification developed in ETRI which includes multiple access ranging, frequency offset compensation, and SNR estimation.
 - Developed an OFDMA uplink simulator using Simulink.
 - Programmed a fixed point simulator.
 - Implemented a synchronization block in VHDL targeted on Xilinx XC2V8000.
 - Implemented a modem based on an IEEE 802.11a-like OFDM technology in FPGA.
 - Programmed a GUI design tool using C++ (MFC) for determining quantization levels.
 - Implemented an OFDM modem in VHDL targetted on Xilinx XCV2000E.
 - Implemented a 3GPP W-CDMA Node-B physical channel modulator in FPGA.
 - Performed unit tests, system integration tests, and field tests for 3GPP W-CDMA systems including power control and handover.
- AGENCY FOR DEFENSE DEVELOPMENT (ADD) Korea
Researcher, *Tracking Systems Division* 02/1998 – 10/2000
- Researched signal processing techniques associated with testing and evaluating weapon systems.
 - Heights of burst and trajectory estimation algorithms.
 - Studied problems associated with direction of signal arrivals.
 - Subspace tracking algorithms.

- Assisted in developing echo cancellation algorithms for CDMA mobile phones.

Publications

JOURNAL

- Juyul Lee and Nihar Jindal, "Energy-efficient scheduling of delay constrained traffic over fading channels," To appear: *IEEE Transactions on Wireless Communications*.
- Juyul Lee and Nihar Jindal, "High SNR analysis for MIMO broadcast channels: Dirty paper coding versus linear precoding," *IEEE Transactions on Information Theory*, vol. 53, no. 12, pp. 4787-4792, Dec. 2007.

CONFERENCE

- Juyul Lee and Nihar Jindal, "Delay constrained scheduling over fading channels: Optimal policies for monomial energy-cost functions," submitted *IEEE Int'l Conf. on Commun.(ICC)*, Sept. 2008.
- Juyul Lee and Nihar Jindal, "Energy-efficient scheduling of delay constrained traffic over fading channels," *IEEE Int'l Symp. on Information Theory (ISIT)*, Toronto, ON, Jul. 2008.
- Juyul Lee and Nihar Jindal, "Dirty paper coding vs. linear precoding for MIMO broadcast channels," *Asilomar Conference on Signals, Systems, and Computers*, Asilomar, CA, Oct. 2006. (Invited Paper)
- Juyul Lee and Nihar Jindal, "Symmetric capacity of downlink MIMO channels," *IEEE Int'l Symp. on Inform. Theory (ISIT)*, Seattle, WA, 2006.
- Juyul Lee and Kyung-Bin Bae, "Numerically stable fast sequential calculation for projection approximation subspace tracking," *IEEE Int'l. Symp. on Circuits and Systems (ISCAS)*, Orlando, FL, 1999.
- Anders Høst-Madsen and Juyul Lee, "Joint delay and impulse response estimation using sliding RLS filters," *IEEE Digital Signal Processing Workshop*, Bryce Cannon, UT, 1998.

Patents

- Juyul Lee, Dae Soon Cho, and Hyeong Jun Park, *Apparatus for automatically adjusting gain in orthogonal frequency division multiplexing system*, 10-2004-0098520, Korean Patent Application, 2004.
- Juyul Lee, and Deuk Su Lyu, *Multichannel preamble processing apparatus for base station synchronization in OFDMA mobile communication systems*, 10-2003-0094832, Korean Patent Applicant, 2003.
- Juyul Lee, Jin Kyu Choi, and Deuk Su Lyu, *An apparatus and method for modulating baseband physical channel using multi-carriers, wireless communication system having thereof*, 10-2002-0079602, Korean Patent Applicant, 2002.
- Ilsoon Jang, Juyul Lee, Hyunjae Kim, and Youngil Kim, *Transmitting system and method of base station in orthogonal frequency division multiplexer-code division multiple access*, 10-2002-0060937, Korean Patent Applicant, 2002.
- Juyul Lee, Deuk Su Lyu and Byung Yang Ahn, *Apparatus for formatting baseband physical channel and basestation modulation system and its processing method in wireless telecommunication system using it*, 10-2001-0085321, Korean Patent Applicant, 2001.

Professional Service

- IEEE Student Member (Societies: Information Theory, Communications)
- Reviewer for IEEE Transactions on Communications
- Beta Tester for MATLAB 7

Skills

COMPUTER PROGRAMS

- C/C++
- MATLAB
- VHDL