Jaemin Han
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SUMMARY

- Strong background in wireless communication systems, information theory, digital signal processing with OFDMA, CSMA, MIMO, Channel Coding, Network Coding techniques
- Knowledge of 802.11 and 3GPP LTE architectures; Hands-on experience in LTE protocol design and enhancement
- 8+ years of programming experience with C/**C**++ and MATLAB for system level simulations; Hands-on experience in designs and simulations of OPNET (now Riverbed, an event-driven network performance evaluation software package)
- Mathematical background in Probability/Measure Theory, Graph Theory, Optimization

EXPERIENCE

Next Generation and Standards, INTEL Oregon, USA
Wireless Standards Engineer Mar. 2016 – Present

- Design and analysis of next generation radio access networks and protocol stacks
- Develop and evaluate technical contributions in 3GPP RAN2/RAN3 standard groups

Center of Wireless Systems and Applications, Purdue University Indiana, USA
Research Assistant Jan. 2010 – Dec. 2015

- Proposed an unified Network Coding framework (incorporating channel erasures, feedback, and scheduling) that can directly compute the linear-optimal throughput of a time-slotted wireless erasure network (e.g., WLAN, E-UTRAN).
- Proposed a new cut-based information-theoretic outerbound, proven to be matched to the capacity for 3-node packet erasure network with channel output feedbacks.
- Characterized complete graph-theoretic network feasibility conditions for the 3-unicast algebraic inter-session network coding scheme based on interference alignment technique.

Next Generation and Standards, INTEL Oregon, USA
Graduate Technical Intern Apr. 2015 – Aug. 2015

- Developed a new Layer-2 relaying protocol design enabling seamless mobility in a LTE-based 5G multi-hop scenario: dynamic/flexible path-switching and traffic-multiplexing without signalling overheads for routing configurations.
- Developed a Network Coding protocol design in a LTE-based D2D-D2N scenario enabling throughput increases for UL/DL traffics via a relay.

Mobile Communication Group, INTEL Oregon, USA
Wireless Systems Intern Aug. 2012 – Jan. 2013

- Developed a cross-layer design and mathematical modeling for LTE-based machine-type communications, with emphasis on Layer-2 protocols.
- Developed a network performance evaluation simulator based on OPNET (C/C++-based network modeling and simulation software) for PHY/Layer-2 abstraction.
  - Perl programming was used for interfacing between the given PHY data sets and OPNET.

Information and Telecommunication Laboratory Seoul, South Korea
Research Assistant Mar. 2007 – Aug. 2009

- Developed resource-preserving diversity-order enhancing techniques using MCS.

EDUCATION

Purdue University Indiana, USA
Ph.D. in Electrical and Computer Engineering Sep. 2009 – May 2016
Advisor: Professor Chih-Chun Wang

Yonsei University Seoul, South Korea
Master of Science in Electrical and Electronic Engineering Mar. 2007 – Aug. 2009
Advisor: Professor Daesik Hong
Bachelor of Science in Electrical and Electronic Engineering Mar. 2000 – Feb. 2007

RELEVANT COURSEWORK

Math-related: Probability Theory, Measure Theory, Graph Theory
Communication-related: Information Theory, Queuing Theory, Communication Networks, Digital Communication and Signal Processing, Error Control Codes, Convex Optimization
CS-related: Algorithms

PUBLICATIONS

Journal Articles

Jaemin Han and Chih-Chun Wang, "Linear Network Coding Capacity Region of The Smart Repeater with Broadcast Erasure Channels," *IEEE Transactions on Information Theory*, to be submitted. (Available at arXiv:1605.01331)

Jaemin Han and Chih-Chun Wang, "General Capacity Region For The Fully-Connected 3-node Packet Erasure Network," *IEEE Transactions on Information Theory*, vol. 62, no. 10, pp. 5503 - 5523, October, 2016.

Chih-Chun Wang and **Jaemin Han**, "The Capacity Region of 2-Receiver Multiple-Input Broadcast Packet Erasure Channels with Channel Output Feedback," *IEEE Transactions on Information Theory.* vol. 60, no. 9, pp. 5597 - 5626, September 2014.

Jaemin Han, and Chih-Chun Wang, "Optimal Linear Network Coding When 3 Nodes Communicate Over Broadcast Erasure Channels with ACK," *ECE Technical Reports*, Purdue University, June 2014. (direct link at docs.lib.purdue.edu/ecetr/459/)

Jaemin Han, and Chih-Chun Wang, "Graph-Theoretic Characterization of The Feasibility of The Precoding-Based 3-Unicast Interference Alignment Scheme," *ECE Technical Reports*, Purdue University, April 2014. (direct link at docs.lib.purdue.edu/ecetr/457/)

Jaemin Han, Eunsung Oh, Hyungsik Ju, and Daesik Hong, "Asymmetric Diversity Modulation in Wireless Fading Relay Channels," *IEEE Transactions on Wireless Communications,* vol. 8, no. 7, pp. 3442-3447, July 2009.

Jaemin Han, Eunsung Oh, Seongwoo Ahn, and Daesik Hong, "A Simple Technique to Enhance Diversity Order in Wireless Fading Relay Channels," *IEEE Communication Letters,* vol. 12, no. 3, pp. 194-196, March 2008.

Conference Papers

Jaemin Han and Chih-Chun Wang, "Linear Network Coding Capacity Region of The Smart Repeater with Broadcast Erasure Channels," in *Proc. IEEE International Symposium on Information Theory (ISIT),* pp. 2144-2148, Barcelona, Spain, July 10-15, 2016.

Jaemin Han and Chih-Chun Wang, "General Capacity Region For The Fully-Connected 3-node Packet Erasure Network," in *Proc. IEEE International Symposium on Information Theory (ISIT),* pp. 2648-2652, Hong Kong, June 14-19, 2015.

Jaemin Han, Chih-Chun Wang, and Ness. B. Shroff, "Analysis of Precoding-Based Intersession Network Coding and The Corresponding 3-Unicast Interference Alignment Scheme," in *Proc. 49th Annual Conference on Communications, Control, and Computing,* pp. 1033-1040, Monticello, Illinois, September 28-30, 2011.

Chih-Chun Wang and **Jaemin Han**, "Common Information of Random Linear Network Coding Over a 1-Hop Broadcast Packet Erasure Channel," in *Proc. IEEE International Symposium on Information Theory (ISIT),* pp. 1708-1712, Saint Petersburg, Russia, July 31-August 5, 2011.

Eunsung Oh, **Jaemin Han**, Hyungsik Ju, and Daesik Hong, "A Novel Rate Allocation scheme for Throughput Maximization considering Rate Fairness in Wireless Relay Systems," in *Proc. IEEE Conference Vehicular Technology (VTC),* pp. 1-5, Barcelona, Spain, April 26-29, 2009.

PATENTS

Filed two U.S. non-provisional patent applications in Dec. 2015 and Jan. 2016.

Jaemin Han, Eunsung Oh, Seongwoo Ahn, and Daesik Hong, "Signal Transmitter using the Diversity Path and Method Thereof," Korean Patent Application Number : 10-2007-0110404.

ACTIVITIES

Reviewer of Journal and Conference Papers
- IEEE Transactions on Communications
- IEEE ISIT 2012 / IEEE SECON 2011

Teaching Assistant at Purdue University

Signal and Systems (ECE 301)	Spring 2012, Fall 2014
Optimization Methods for Systems and Control (ECE 580)	Spring 2011, Spring 2014
Digital Signal Processing with Applications Laboratory (ECE 438L)	Fall 2010

Organizational Activity

President of Purdue Electrical Engineering Korean Association	Fall 2011 – Summer 2012
President of Purdue Wallyholics Club	Spring 2013 – Summer 2014

Invited Talk

"Multi-session Network Coding characterization using new linear coding frameworks," Yonsei University, Jan. 2016.

HONORS AND AWARDS

Hyundai Global Top Talent Forum 2015 Session Best Award ($3000 Prize)	Aug. 2015
Brain Korea (BK) 21st Century Scholarship	Spring 2007 – Spring 2008
Radio Scholarship (The Ministry of Information and Communications)	Fall 2005, Fall 2006
Yonsei University Designated Scholarship	Fall 2000, Spring 2006
Yonsei University Prize of Academic Excellence	Fall 2005
U.S. Army Commendation Medal (ARCOM)	Aug. 2004

- Awarded by U.S. Army for Meritorious Service as Non-commissioned Officer

SKILLS

Programming: C/C++(advance), Perl(experienced), Ruby(basic)
Software Package: OPNET(now Riverbed, experienced), MATLAB(advance), NS2(basic)