

## EXPERIENCE

### Intel Corporation

Oregon, USA

Wireless Standards Research Engineer

Dec. 2015 - Present

- Design and development of advanced PHY and MAC algorithms
- Develop and evaluate technical contributions in 3GPP LTE standards groups through theoretical analysis and simulation

### Purdue University

Indiana, USA

Research Assistant

Jan. 2012 - Dec. 2015

- Multi-resolution codebook and beamforming sequence design in millimeter wave systems
- Pilot beam pattern and hybrid beamforming design in massive MIMO systems
- Precoder design for blind separation and estimation in MIMO-OFDM systems
- Development of a link level simulator based on Digital Video Broadcasting (DVB-T2)
  - Implementation of symbol spreading and frequency/cell/time interleavers with LDPC code

### Wireless Information Systems Research Lab

Daejeon, South Korea

Researcher

Mar. 2010 - Jun. 2011

- Researched user scheduling algorithms for interference alignment via majorization theory

### Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, South Korea

Research Assistant

Feb. 2008 - Feb. 2010

- Linear precoder design for blind channel estimation in MIMO-OFDM systems
- Development of a link level simulator for high mobility environments based on IEEE 802.16e/m
  - Implementation of tone clustering, slot mapping, and bit interleaver with convolutional code

### Communication Network Security Lab

Seoul, South Korea

Research Intern

Oct. 2006 - Feb. 2007

- Development of voice spam control algorithm for Voice over IP systems (VoIP).

### Republic of Korea Army

Paju, South Korea

Sergeant: Mandatory military service in South Korea

Dec. 2002 - Jan. 2005

## EDUCATION

### Purdue University

Indiana, USA

Ph.D. in Electrical and Computer Engineering

Aug. 2011 – Dec. 2015

Advisors: Professors Michael Zoltowski and David Love

### Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, South Korea

Master of Science in Electrical Engineering

Feb. 2010

Advisor: Professor Youngchul Sung

### Soongsil University

Seoul, South Korea

Bachelor of Engineering in Electrical Engineering

Feb. 2008

## PUBLICATIONS Journal Articles Under Review

**Song Noh**, Michael Zoltowski, and David Love, "Multi-resolution codebook and adaptive beamforming sequence design for millimeter wave beam alignment," submitted to *IEEE Trans. Wireless Commun.*, 2015 (Available at <http://docs.lib.purdue.edu/ecetr/468/>).

### Journal Articles

Il Y. Chun, **Song Noh**, David Love, Thomas M. Talavage, Stephen Beckley, and Sherman J. Kisner, "Mean square error (MSE)-based excitation pattern design for parallel transmit and receive SENSE MRI image reconstruction," *IEEE Trans. Comput. Imag.*, vol. 2, no. 4, pp. 424 – 439, Dec. 2016.

**Song Noh**, Michael Zoltowski, and David Love, "Training sequence design for feedback assisted hybrid beamforming in massive MIMO systems," *IEEE Trans. Commun.*, vol. 61, no. 1, pp 187 – 200, Jan. 2016.

**Song Noh**, Michael Zoltowski, Youngchul Sung, and David Love, "Pilot beam pattern design for channel estimation in massive MIMO systems," *IEEE J. Sel. Topics Signal Process.*, vol. 8, no. 5, pp. 787 – 801, Oct. 2014.

**Song Noh**, Youngchul Sung, and Michael Zoltowski, "A new precoder design for blind channel estimation in MIMO-OFDM systems," *IEEE Trans. Wireless Commun.*, vol. 13, no. 12, pp. 7011 – 7024, Dec. 2014.

### **Conference Papers**

**Song Noh**, Michael Zoltowski, and David Love, "Multi-resolution codebook based beamforming sequence design in millimeter-wave systems," in *Proc. IEEE Globecom*, San Diego, CA, Dec. 2015.

**Song Noh**, Michael Zoltowski, and David Love, "Downlink training codebook design and hybrid precoding in FDD massive MIMO systems," in *Proc. IEEE Globecom*, Austin, TX, Dec. 2014. **(Best Paper Award)**

**Song Noh**, Michael Zoltowski, Youngchul Sung, and David Love, "Training signal design for channel estimation in massive MIMO systems," in *Proc. IEEE ICASSP*, Florence, Italy, May 2014.

**Song Noh** and Michael Zoltowski, "A new precoder design for precoding-based blind channel estimation for MIMO-OFDM systems," in *Proc. IEEE Globecom*, Atlanta, GA, Dec. 2013.

**Song Noh** and Michael Zoltowski, "Blind separation for precoding-based blind channel estimation for MIMO-OFDM systems," in *Proc. Asilomar*, Pacific Grove, CA, Nov. 2013.

**Song Noh**, Michael Zoltowski, Youngchul Sung, and David Love, "Optimal pilot beam pattern design for massive MIMO systems," in *Proc. Asilomar*, Pacific Grove, CA, Nov. 2013.

### **EXTERNAL ACTIVITIES**

#### **Reviewer of Journal and Conference Papers**

- IEEE Transactions on Communications
- IEEE Transactions on Wireless Communications
- IEEE Transactions on Vehicular Technology
- IEEE Communications Letters
- IEEE Wireless Communications Letters
- IEEE Signal Processing Communications Letters
- IEEE ICC 2015/ IEEE WCNC 2015/ IEEE Globecom 2015

#### **Invited Talks**

Channel estimation initiatives through training signal design in large-scale MIMO, at Soongsil University, Sep. 2014, and at KAIST, Aug. 2014.

#### **Teaching Assistant**

Digital Signal Processing I (ECE 538), Purdue University	Fall 2014
Advanced Communication System (EE 522), KAIST	Fall 2009
Communication System (EE 421), KAIST	Spring 2009

### **AWARDS AND HONORS**

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|---|----------------------|
| - IEEE Transactions on Communications Exemplary Reviewer                | Apr. 2015            |
| - Silver Prize in the 21st HumanTech Paper Contest sponsored by Samsung | Feb. 2015            |
| - IEEE Global Communications Conference (Globecom) Best Paper Award     | Dec. 2014            |
| - Soongsil University Talented Scholar Fellowship                       | Sep. 2012 - May 2013 |
| - GPA Scholarship, Soongsil University                                  | 2005 - 2007          |

### **COMPUTER SKILLS**

MATLAB, Simulink, C, and C++