

# HOSUNG PARK

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Associate Professor, Ph.D.  
School of Electronics & Computer Engineering  
Chonnam National University, Gwangju, Korea

## CONTACT

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## EXPERIENCE

- Mar. 2015 – present  
Associate Professor  
**School of Electronics and Computer Engineering, Chonnam National University**, Gwangju, Korea
- Sep. 2013 – Jan. 2015  
Postdoctoral researcher (Advisor: Young-Han Kim)  
**Qualcomm Institute, California Institute for Telecommunications and Information Technology, University of California, San Diego**, La Jolla, CA, USA
- Mar. 2013 – Aug. 2013  
Postdoctoral researcher (Advisor: Jong-Seon No)  
**Institute of New Media and Communications, Seoul National University**, Seoul, Korea

## EDUCATION

- Mar. 2009 – Feb. 2013  
Ph.D. in Electrical Engineering and Computer Science  
**Seoul National University**, Seoul, Korea  
(Thesis title: Combinatorial construction of quasi-cyclic LDPC codes using multi-weight circulants, Advisor: Prof. Jong-Seon No)
- Mar. 2007 – Feb. 2009  
M.S. in Electrical Engineering and Computer Science  
**Seoul National University**, Seoul, Korea  
(Thesis title: LDPC decoding schemes with post-processing for lowering error floors, Advisor: Prof. Jong-Seon No)
- Mar. 1998 – Feb. 2007  
B.S. in Electrical and Computer Engineering  
**Seoul National University**, Seoul, Korea

## RESEARCH INTERESTS

Channel coding, coding for NAND flash memory, coding for DNA storage, coding for computing, communications systems, machine learning, compressed sensing, network information theory, network coding

1. Beomkyu Shin, Hosung Park\*, Jong-Seon No, and Habong Chung, "Multi-stage decoding scheme with post-processing for LDPC codes to lower the error floors," *IEICE Trans. Commun.*, vol. E94-B, no. 8, pp. 2375–2377, Aug. 2011.
2. Seokbeom Hong, Hosung Park, Beomkyu Shin, Jong-Seon No, and Habong Chung, "A new performance measure using  $k$ -set correlation for compressed sensing matrices," *IEEE Sig. Process. Lett.*, vol. 19, no. 3, pp. 143–146, Mar. 2012.
3. Hosung Park, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "Design of multiple-edge protographs for QC LDPC codes avoiding short inevitable cycles," *IEEE Trans. Inf. Theory*, vol. 59, no. 7, pp. 4598–4614, Jul. 2013.
4. Hosung Park, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "Construction of high-rate regular quasi-cyclic LDPC codes based on cyclic difference families," *IEEE Trans. Commun.*, vol. 61, no. 8, pp. 3108–3113, Aug. 2013.
5. Beomkyu Shin, Sang-Hyo Kim, Hosung Park\*, Jong-Seon No, and Dong-Joon Shin, "New stopping criteria for iterative decoding of LDPC codes in H-ARQ systems," *Int. J. Commun. Syst.*, vol. 26, no. 11, pp. 1475–1484, Nov. 2013.
6. Beomkyu Shin, Hosung Park\*, Seokbeom Hong, Jong-Seon No, and Sang-Hyo Kim, "Quasi-cyclic LDPC codes using overlapping matrices and their layered decoders," *AEU – Int. J. Electron. Commun.*, vol. 68, no. 5, pp. 379–383, May 2014.
7. Seokbeom Hong, Hosung Park, Jong-Seon No, Tor Helleseth, and Young-Sik Kim, "Near-optimal partial Hadamard codebook construction using binary sequences obtained from quadratic residue mapping," *IEEE Trans. Inf. Theory*, vol. 60, no. 6, pp. 3698–3705, Jun. 2014.
8. Kee-Hoon Kim, Hosung Park, Seokbeom Hong, and Jong-Seon No, "Fast correlation method for partial Fourier and Hadamard sensing matrices in matching pursuit algorithms," *IEICE Trans. Fundamentals*, vol. E97-A, no. 8, pp. 1674–1679, Aug. 2014.
9. Kee-Hoon Kim, Hosung Park, Jong-Seon No, Habong Chung, and Dong-Joon Shin, "Clipping noise cancellation for OFDM systems using reliable observations based on compressed sensing," *IEEE Trans. Broadcast.*, vol. 61, no. 1, pp. 111–118, Mar. 2015.
10. Beomkyu Shin, Seokbeom Hong, Hosung Park\*, Jong-Seon No, and Dong-Joon Shin, "New decoding scheme for LDPC codes based on simple product code structure," *J. Commun. Netw.*, vol. 17, no. 4, pp. 351–361, Aug. 2015.
11. Hosung Park and Young-Sik Kim, "Construction of fractional repetition codes with variable parameters for distributed storage systems," *Entropy*, vol. 18, no. 12, pp. 441:1–8, Dec. 2016.
12. Bohwan Jun, Pilwoong Yang, Jong-Seon No, and Hosung Park, "New fountain codes with improved intermediate recovery based on batched zigzag coding," *IEEE Trans. Commun.*, vol. 65, no. 1, pp. 23–36, Jan. 2017.
13. Pilwoong Yang, Bohwan Jun, Jong-Seon No, and Hosung Park\*, "A new two-stage decoding scheme with unreliable path search to lower the error-floor for LDPC codes," *IET Commun.*, vol. 11, no. 14, pp. 2173–2180, Oct. 2017.
14. Young-Sik Kim, Hosung Park\*, and Jong-Seon No, "Construction of new fractional repetition codes from relative difference sets with  $\lambda = 1$ ," *Entropy*, vol. 19, no. 10, pp. 563:1–17, Oct. 2017.
15. Young-Sik Kim, Hosung Park, and Sang-Hyo Kim, "DNA codes with constant GC-content constructed from Hadamard matrix," *IEICE Trans. Fundamentals*, vol. E100-A, no. 11, pp. 2408–2415, Nov. 2017.
16. Hosung Park, Kee-Hoon Kim, Jong-Seon No, and Dae-Woon Lim, "Reconstruction of complex sparse signals in compressed sensing with real sensing matrices," *Wireless Pers. Commun.*, vol. 97, no. 4, pp. 5719–5731, Dec. 2017.

17. Yulong Shang, Hojun Kim, Taejin Jung, and Hosung Park, "**Generalized spatial modulation based on quaternary quasi-orthogonal sequences**," *IEICE Trans. Fundamentals*, vol. E101-A, no. 3, pp. 640–643, Mar. 2018.
18. Bohwan Jun, Heeyoul Kwak, Jong-Seon No, and Hosung Park\*, "**Flexible WOM codes for NAND flash memory based on raptor-like codes**," *J. Commun. Netw.*, vol. 20, no. 2, pp. 122–128, Apr. 2018.
19. Kang-Seok Lee, Hosung Park\*, and Jong-Seon No, "**New binary locally repairable codes with locality 2 and non-even availabilities for hot data**," *Entropy*, vol. 20, no. 9, pp. 636:1–9, Sep. 2018.
20. Jihye Lee, Sangmi Moon, Soonho Kwon, Myeonghun Chu, Sara Bae, Cheolwoo You, Huaping Liu, Jeong-Ho Kim, Dae Jin Kim, Hosung Park, Jin Young Kim, and Intae Hwang, "**Adaptive channel estimation scheme based on LTE uplink in V2V environments**," *Wireless Pers. Commun.*, vol. 102, no. 1, pp. 383–398, Sep. 2018.
21. Soonho Kwon, Daeoh Kim, Jihye Lee, Sangmi Moon, Myeonghun Chu, Sara Bae, Cheolwoo You, Huaping Liu, Jeong-Ho Kim, Dae Jin Kim, Hosung Park, Jin Young Kim, Cheol-Sung Kim, and Intae Hwang, "**3D localization for launch vehicle using virtual TOA and AOA of ground stations**," *Wireless Pers. Commun.*, vol. 102, no. 1, pp. 507–526, Sep. 2018.
22. Soonho Kwon, Daeoh Kim, Jihye Lee, Sangmi Moon, Myeonghun Chu, Sara Bae, Cheolwoo You, Huaping Liu, Jeong-Ho Kim, Dae Jin Kim, Hosung Park, Jin Young Kim, Cheol-Sung Kim, and Intae Hwang, "**Performance analysis of 3D localization for a launch vehicle using TOA, AOA, and TDOA**," *Wireless Pers. Commun.*, vol. 103, no. 2, pp. 1443–1464, Nov. 2018.
23. Jihye Lee, Sangmi Moon, Soonho Kwon, Myeonghun Chu, Sara Bae, Cheolwoo You, Huaping Liu, Jeong-Ho Kim, Dae Jin Kim, Hosung Park, Jin Young Kim, and Intae Hwang, "**Novel interference cancellation of channel estimation scheme based on LTE in V2V communications**," *Wireless Pers. Commun.*, vol. 103, no. 3, pp. 2109–2124, Dec. 2018.
24. Hyunjee Lee, Haseong Kim, and Hosung Park\*, "**Novel calibration of MIESM and reduction of CQI feedback for improved fast link adaptation**," *Electronics*, vol. 8, no. 3, pp. 278:1–14, Mar. 2019.
25. Heeyoul Kwak, Jong-Seon No, and Hosung Park, "**Design of irregular SC-LDPC codes with non-uniform degree distributions by linear programming**," accepted for *IEEE Trans. Commun.*, Dec. 2018.
26. Lele Wang, Young-Han Kim, Chiao-Yi Chen, Hosung Park, and Eren Sasoglu, "**Sliding-window superposition coding: Two-user interference channels**," submitted to *IEEE Trans. Inf. Theory*, Jan. 2017.
27. Haseong Kim, Hyunjee Lee, and Hosung Park\*, "**Low-complexity successive cancellation flip decoding using distributed CRC bits for polar codes**," submitted to *Entropy*, Feb. 2019.
28. Kee-Hoon Kim and Hosung Park\*, "**New design of constellation and bit mapping for dual mode OFDM-IM**," submitted to *IEEE Access*, Mar. 2019.
29. Hosung Park, Heeyoul Kwak, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "**Variable-weight block dual-diagonal structure for low-rate QC LDPC codes with low error floors**," submitted to *IEEE Trans. Commun.*, Mar. 2019.
  - 12 papers published in Korean journals

## CONFERENCE PROCEEDINGS

1. Hosung Park, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "**Protograph design for QC LDPC codes with large girth**," in *Proc. Int. Conf. Inf. Commun. Technol. Convergence (ICTC)*, Jeju Island, Korea, Nov. 2010, pp. 175–176.
2. Seokbeom Hong, Hosung Park, Beomkyu Shin, Jong-Seon No, and Habong Chung, "**New performance measure for compressive sensing matrices using  $k$ -set correlation**," in *Proc. Int. Conf. Inf. Commun. Technol. Convergence (ICTC)*, Jeju Island, Korea, Nov. 2010, pp. 111–112.
3. Hosung Park, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "**Protograph design with multiple edges for regular QC LDPC codes having large girth**," in *Proc. IEEE Int. Symp. Inf. Theory (ISIT)*, St. Petersburg, Russia, Aug. 2011, pp. 923–927.
4. Hosung Park, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "**A new parity structure with multi-weight circulants for QC LDPC codes**," in *Proc. IEEE Int. Symp. Inf. Theory (ISIT)*, Cambridge, MA, Jul. 2012, pp. 3103–3107.
5. Hosung Park, Jong-Seon No, Beomkyu Shin, and Habong Chung, "**On the combinatorial substructures of LDPC codes causing error floors in the AWGN channel**," in *Proc. Int. Conf. Inf. Commun. Technol. Convergence (ICTC)*, Jeju Island, Korea, Oct. 2012, pp. 420–425.
6. Hosung Park, Young-Han Kim, and Lele Wang, "**Interference management via sliding-window superposition coding**," in *Proc. IEEE Global Commun. Conf. (GLOBECOM, Wi5G)*, Austin, TX, Dec. 2014, pp. 951–955.
7. Bohwan Jun, Pilwoong Yang, Jong-Seon No, and Hosung Park, "**New rateless codes for receiver with limited memory**," in *Proc. Int. Conf. Inf. Commun. Technol. Convergence (ICTC)*, Jeju Island, Korea, Oct. 2015, pp. 482–484.
8. Kwang Taik Kim, Seok-Ki Ahn, Young-Han Kim, Hosung Park, Lele Wang, Chiao-Yi Chen, and Jeongho Park "**Adaptive sliding-window coded modulation in cellular networks**," in *Proc. IEEE Global Commun. Conf. (GLOBECOM)*, San Diego, CA, Dec. 2015, pp. 1–7.
9. Kee-Hoon Kim, Hosung Park, Jong-seon No, Habong Chung, Dae-Woon Lim, "**Compressive sensing based clipping noise cancellation for OFDM systems**," in *Proc. 2016 URSI Asia-Pacific Radio Sci. Conf.*, Seoul, Korea, Aug. 2016, pp. 1866–1869.
10. Yong Sung Kil, Sang-Hyo Kim, and Hosung Park, "**MTTDL for distributed storage systems with double node failures**," in *Proc. Int. Conf. Inf. Commun. Technol. Convergence (ICTC)*, Jeju Island, Korea, Oct. 2017, pp. 967–969.
11. Hyunjee Lee, Haseong Kim, and Hosung Park, "**Improved calibration procedure of block error rate estimation for fast link adaptation**," in *Proc. IEEE Int. Conf. Comput. Commun. (ICCC)*, Chengdu, China, Dec. 2018, pp. 89–93.
12. Haseong Kim, Hyunjee Lee, and Hosung Park, "**Interleaver-aided successive cancellation flip decoding algorithm for polar codes**," in *Proc. IEEE Int. Conf. Comput. Commun. (ICCC)*, Chengdu, China, Dec. 2018, pp. 2559–2563.
13. Hosung Park, "**Construction of quasi-cyclic LDPC codes using a class of balanced incomplete block designs with irregular block sizes**," in *Proc. Int. Conf. Sig. Process. Inf. Commun. (ICSPIC)*, Phuket, Thailand, Jan. 2019, p. 20.
  - 23 papers presented at Korean conferences

## PATENTS

1. Jong-seon No, Beom-kyu Shin, Ho-sung Park, Yong-june Kim, Jae-hong Kim, Young-hwan Lee, and Jun-jin Kong, "**Decoding method and memory system device using the same**," US patent, 8397116, 20130312 (application No. 10/652768, 20100106), IPC: H03M 13/00.

2. Beomkyu Shin, Hosung Park, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "**Product code decoding method and device**," US patent, 8468430, 20130618 (application No. 11/005294, 20110112), IPC: H03M 13/00.
3. Kwangtaik Kim, Seokki Ahn, Young-Han Kim, Hosung Park, Lele Wang, Chiao-Yi Chen, and Jeongho Park, "**Method and apparatus for transmitting signal using sliding-window superposition coding in wireless network**," US patent, 9699008, 20170704 (application No. 15/081381, 20160325), IPC: H04L-025/03, H04B-007/06, H04L-025/06.
  - \* Young-Han Kim, Lele Wang, Hosung Park, and Eren Sasoglu, "**Methods and apparatus for coding for interference network**," US patent, provisional application No. 62/057193, 20140929.
4. Byong Hyok Choi, Jong Seon No, Seok Beom Hong, Pil Woong Yang, Bo Hwan Jun, Young Seo Park, and Ho Sung Park, "**Electronic shelf label gateway, electronic shelf label system and communications method thereof**," US patent application No. 14/583562, 20141226.
5. Byong Hyok Choi, Jong Seon No, Seok Beom Hong, Pil Woong Yang, Bo Hwan Jun, Young Seo Park, and Ho Sung Park, "**Electronic shelf label gateway, electronic shelf label system and communications method thereof**," EP patent, application No. 15155677.6, 20150219.
6. Young-Han Kim, Lele Wang, Hosung Park, and Eren Sasoglu, "**Methods and apparatus for coding for interference network**," PCT patent, application No. PCT/US2015/052986, 20150929.
7. Young-Han Kim, Lele Wang, Hosung Park, and Eren Sasoglu, "**Methods and apparatus for coding for interference network**," US patent, application No. 15/514092, 20150929.
8. Kwangtaik Kim, Seokki Ahn, Younghan Kim, Hosung Park, Lele Wang, Chiaoyi Chen, and Jeongho Park, "**Method and apparatus for transmitting signal using sliding-window superposition coding in wireless network**," PCT patent, application No. PCT/KR2016/003094, 20160325.
  - o 8 registered patents and 6 applications for Korean patents

#### SELECTED TALKS

1. Beomkyu Shin, Seokbeom Hong, Hosung Park, Jong-Seon No, and Dong-Joon Shin, "**A new decoding scheme of LDPC codes for lowering error floor**," *Inf. Theory Appl. (ITA) Workshop*, San Diego, CA, Feb. 2011.
2. Hosung Park, Jong-Seon No, and Dong-Joon Shin, "**New dual-diagonal structure for low-rate QC LDPC codes with multi edges**," *Inf. Theory Appl. (ITA) Workshop*, San Diego, CA, Feb. 2012.
3. Hosung Park, Seokbeom Hong, Jong-Seon No, and Dong-Joon Shin, "**Algebraic construction of single-row QC LDPC codes**," *Inf. Theory Appl. (ITA) Workshop*, San Diego, CA, Feb. 2013.
4. Kwang Taik Kim, Seok-Ki Ahn, Young-Han Kim, Hosung Park, Lele Wang, Chiao-Yi Chen, and Jeongho Park, "**Adaptive sliding-window coded modulation for advanced interference management in 5G**," *Inf. Theory Appl. (ITA) Workshop*, San Diego, CA, Feb. 2016.

#### AWARDS & HONORS

1. Inclusion in Marquis Who's Who in the World 2016 (33rd Edition)

**ACADEMIC  
ACTIVITIES &  
SERVICE**

1. 한국통신학회 이사 (2016. 1. 1. – 현재)
2. 한국통신학회 이동통신연구회 (2016. 1. 1. – 현재)
3. 한국통신학회 부호및정보이론연구회 (2018. 1. 1. – 현재)
4. Session organizer for Information Theory and Applications (ITA) Workshop 2014, San Diego, CA
5. 국립전파연구원 항공업무용 무선설비 기술기준 연구반장 (2015. 3. – 2015. 5.)
6. 한국방송통신전파진흥원 주파수 적정성 조사분석 자문위원 (2017. 4. – 2017. 10.)
7. 통신정보합동학술대회 (JCCI) TPC member (2016, 2017)
8. 2017년도 한국통신학회 추계종합학술발표회 학부 및 고등부 논문 프로그램 위원
9. Reviewer for international journals and conferences (selected)
  - IEEE Transactions on Information Theory
  - IEEE Journal on Selected Areas in Communications
  - IEEE Transactions on Communications
  - IEEE Transactions on Wireless Communications
  - IEEE Communications Letters
  - IEEE Wireless Communications Letters
  - IEEE Access
  - IET Communications
  - IET Signal Processing
  - Electronics Letters
  - IEEE International Symposium on Information Theory
  - IEEE Information Theory Workshop
  - IEEE Global Communications Conference
  - IEEE International Conference on Communications