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Personal Profile

Jeongseok Ha had the PhD degree in Electrical Engineering from Georgia Institute of Technology (Georgia Tech), USA in December 2003. Now, he is with Korea Advanced Institute of Science and Technology (KAIST) as an associate professor since September 2010. **His research interests include error-control coding theory and physical layer security.** He has published in the related areas **34 journals** and **62 conference papers** which have been **cited more than 1,800 times in total**. He also holds 38 patents including 6 US patents.

In his earlier **contributions to** the theory and practice of **rate-compatible low-density parity-check codes**, he proposed novel puncturing schemes which have been proven eventually very influential. His research results on these topics have been **cited more than 600 times across a broad range of areas** including distributed source/video coding and wireless communications. He keeps his research momentum of the error-correction codes toward developing error-control systems for the next generation storage devices such as NAND FLASH memory devices and solid state drives in close collaboration with researchers in industries and academia. In particular, his contributions to industry were recognized with **the outstanding patent award from SK-hynix in 2015**.

He further **extended his research interests to physical layer security** for wireless communications and devices with limited resources such as Radio Frequency Identification (RF ID) tags and sensor nodes in wireless sensor networks. His work paves the way for information theoretic secrecy measures for wireless devices which are vulnerable to eavesdropping and at the same time with limited computing power and energy resources, forbidding use of conventional cryptographic security solutions. Two of his related publications were **selected as Best Readings in Communications and Information Systems Security 2013 by IEEE COMSOC**. He has also investigated design of practical codes at short block lengths over wire-tap channel. In the research activity, he is developing new design criteria which lay a new foundation for wire-tap channel code design at finite lengths. **His work on wire-tap channel code design has been cited more than 200 times** over last four years.

Currently, he is focusing on developing a generalized framework of cross-layer optimization for secrecy systems. To achieve the goal, he is planning interdisciplinary collaborations with researchers working in the areas of mathematics, RF device design, cryptology, etc. His research activity was recognized and selected one of **outstanding research achievements in Basic Science Research Program 2012** by Korean Research Foundation (KRF) who also awarded him **the outstanding research prize in 2014**. In addition, results of his work are licensed to a startup company in US, which shows his work has not only academic significance but also meaningful contributions to industry. His long pursuing contributions to industry enables a physical layer security solution to be adopted in IEEE 802.15.8 standard, which is **the world's first standardization of physical layer security** for wireless communications.

He has been actively **servicing for many academic societies and industry partners** as a reviewer, technical committee member, steering committee member, and advisor. He was chosen as **an exemplary reviewer by IEEE Communications Letters, 2012**, which honors the best 3% reviewers.

Education

Dec. 2003 PhD in Electrical Engineering,
Georgia Institute of Technology, Atlanta, Georgia, USA

Experience

Sept. 2010 - Present Associate Professor, School of Electrical Engineering,
Korea Advanced Institute of Science and Technology (KAIST), Korea

Mar. 2009 – Aug. 2010 Assistant Professor, School of Electrical Engineering,
Korea Advanced Institute of Science and Technology (KAIST), Korea

Sept. 2004 – Feb. 2009 Assistant Professor, School of Engineering,
Information and Communications University (ICU), Korea

Dec. 2003 – Sept. 2004 Postdoctoral Fellow, Georgia Institute of Technology, USA
School of Electrical & Computer Engineering

Sept. 1999 – Dec. 2003 Graduate Research Assistant, Georgia Institute of Technology, USA
School of Electrical & Computer Engineering

Mar. 1994 – July 1999 Member of Research Staff in Electronics and Telecommunications Research
Institute (ETRI), Korea

Publications

Journal Papers

- [1] D. Kim, and J. Ha, "Symmetric Block-wise Concatenated BCH Codes for NAND Flash Memories," *IEEE Transactions on Communications*, vol. 66, issue 10, pp. 4365-4380, Oct. 2018
- [2] J. Oh, and J. Ha, "A Two-Bit Weighted Bit-Flipping Decoding Algorithm for LDPC Codes," *IEEE Communications Letters*, vol. 22, issue 5, pp. 874-877, May. 2018
- [3] S. Yun, S. Im, I. Kim, and J. Ha, "On the Secrecy Rate and Optimal Power Allocation for Artificial Noise Assisted MIMOME Channels," *IEEE Transactions on Vehicular Technology*, vol. 67, issue 4, pp. 3098-3113, Apr. 2018
- [4] J. Kang, J. Yang, J. Ha, I. Kim, "Joint Design of Optimal Precoding and Cooperative Jamming for Multi-User Secure Broadcast Systems," *IEEE Transactions on Vehicular Technology*, vol. 66, issue 11, pp. 10551-10556, Nov. 2017
- [5] J. Nam, G. Caire, YJ. Ko, J. Ha, "On the Role of Transmit Correlation Diversity in Multiuser MIMO Systems," *IEEE Transactions on Information Theory*, vol. 63, no. 1, pp. 336-354, Jan. 2017
- [6] J. Oh, J. Ha, H. Park and J. Moon, "RS-LDPC Concatenated Coding for the Modern Tape Storage Channel," *IEEE Transactions on Communications*, vol. 64, pp. 59-69, Jan. 2016
- [7] S. Kang, J. Moon, J. Ha, and J. Shin, "Breaking the Trapping Sets in LDPC Codes: Check Node Removal and Collaborative Decoding," *IEEE Transactions on Communications*, vol. 64, pp. 15-26, Jan. 2016
- [8] S. Im, H. Jeon, J. Choi, and J. Ha, "Secret Key Agreement with Large Antenna Arrays under the Pilot Contamination Attack," *IEEE Transactions on Wireless Communications*, vol. 14, pp. 6579-6594, Dec. 2015
- [9] D. Kim, and J. Ha, "Quasi-Primitive Block-wise Concatenated BCH Codes with Collaborative Decoding for NAND Flash Memories," *IEEE Transactions on Communications*, vol. 63, pp. 3482-3496, Oct. 2015
- [10] J. Nam, Y. Ko, and J. Ha, "User Grouping of Two-Stage MU-MIMO Precoding for Clustered User Geometry," *IEEE Communications Letters*, vol. 19, pp. 1458-1461, Aug. 2015
- [11] S. Cho, D. Kim, J. Choi, and J. Ha, "Block-wise Concatenated BCH Codes for NAND Flash

- Memories," *IEEE Transactions on Communications*, vol. 62, issue 4, pp. 1164-1177, Apr. 2014
- [12] H. Jeon, S. McLaughlin, I. Kim, and J. Ha, "Secure Communications with Untrusted Secondary Nodes in Cognitive Radio Networks," *IEEE Transactions on Wireless Communications*, vol. 13, pp. 1790-1805, Apr. 2014
- [13] J. Choi, and J. Ha, "Iterative Demodulation and Decoding of Uplink Multiuser M -ary FSK using OFDMA Mapping," *IEEE, Communications Letters*, vol. 17, issue 9, pp. 1842-1845, Sep. 2013
- [14] J. Choi, and J. Ha, H. Jeon, "On the Energy Delay Tradeoff of HARQ-IR in Wireless Multiuser Systems," *IEEE Transactions on Communications*, vol. 61, issue 8, pp. 3518-3529, Aug. 2013
- [15] J. Choi, and J. Ha, "On the Energy Efficiency of AMC and HARQ-IR with QoS Constraints," *IEEE Transactions on Vehicular Technology*, vol. 62, issue 7, pp. 3261-3270, Sep. 2013
- [16] H. Jeon, J. Choi, S. W. McLaughlin, and J. Ha, "Channel Aware Encryption and Decision Fusion for Wireless Sensor Networks," *IEEE Transactions on Information Forensics and Security*, vo. 8, no. 4, pp. 619-625, Apr. 2013
- [17] J. Oh, J. Ha, J. Moon, and G. Ungerboeck, "RS-Enhanced TCM for Multilevel Flash Memories," *IEEE Transactions on Communications*, vol. 61, issue 5, pp. 1674-1683, May. 2013
- [18] W. Song, J. Choi, and J. Ha, "Perfect Secrecy over Binary Erasure Wiretap Channel of Type-II," *IEEE Transactions on Information Forensics and Security*, vol. 7, no. 4, pp. 1414-1418, Aug. 2012
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- [21] D. Klinc, J. Ha, S. W. McLaughlin, J. Barros, and B. Kwak, "LDPC Codes for the Gaussian Wiretap Channel," *IEEE Transactions on Information Forensics and Security*, vol. 6, no. 3, pp. 532-540, Sept. 2011
- [22] H. Jeon, D. Hwang, J. Choi, H. Lee, and J. Ha, "Secure Type-Based Multiple Access," *IEEE Transactions on Information Forensics and Security*, vol.6, no.3, pp.763-774, Sept. 2011
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- [24] H. Jeon, J. Choi, H. Lee, and J. Ha, "Channel-aware energy efficient transmission strategies for large wireless sensor networks," *IEEE Signal Processing Letters*, vol. 17, no. 7, pp. 643-646, July 2010
- [25] C. Jung, J. Choi, and J. Ha, "Asymmetric power allocation to improve convergence rate of iterative receivers," *IEEE Communications Letters*, vol. 13, no. 8, pp. 579-581, Aug. 2009
- [26] J. Choi, and J. Ha, "Rate optimization to minimize distortion for source-channel coded H-BLAST with SIC decoding," *IEEE Communications Letters*, vol.13, no.2, Feb. 2009
- [27] D. Shin, J. Ha, K. Heo, and H. Lee, "A Stopping Criterion for Low-Density Parity-Check Codes," *IEICE Transactions on Communications*, vol. E91-B, no. 4, pp. 1145-1148, Apr. 2008
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- [29] J. Ha, D. Klinc, J. Kwon, and S. W. McLaughlin, "Layered BP Decoding for Rate-Compatible Punctured LDPC Codes," *IEEE Communications Letters*, vol. 11, no. 5, pp. 440-442, May 2007
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- [31] J. Ha, and S. W. McLaughlin, "Rate-compatible puncturing of low-density parity-check codes," *IEEE Transactions on Information Theory*, vol. IT-50, pp.2824-2836, Nov. 2004
- [32] J. Ha, and S. W. McLaughlin, "Low-density parity-check codes over Gaussian channels with erasures," *IEEE Transactions on Information Theory*, vol. IT-49, pp. 1801-1809, July 2003

- [33] J. Ha, A. N. Mody, J. Sung, J. R. Barry, S. W. McLaughlin, and G. L. Stuber, "LDPC Coded OFDM with Alamouti/SVD diversity technique," *Wireless Personal Communications*, 23(1): 183-194; Oct 2002
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Conference papers

- [1] M. Ko, S. Yun, J. Park, and J. Ha, "Artificial-noise-aided Secure Beamforming in Full-duplex Wireless-powered Relay," IEEE WCNC 2018, Jun. 2018
- [2] S. Hwang, J. Jung, D. Kim, I. Park, Y. Lee, and J. Ha, "An energy-optimized (37840, 34320) symmetric BC-BCH decoder for healthy mobile storages," IEEE A-SSCC 2017, Seoul, Nov. 2017
- [3] M. Ko, S. Yun, and J. Ha, "Resource Allocation Scheme for Wireless Powered Wiretap Channel," IEEE ICTC 2017, Jeju, Oct. 2017
- [4] J. Park, S. Yun, and J. Ha, "Secure Full-Duplex Relay Network using Cooperative Jamming," IEEE ICTC 2017, Jeju, Oct. 2017
- [5] S. Yun, J. Park, S. Im and J. Ha, "On the Secrecy Rate of Artificial Noise Assisted MIMOME Channels with Full-duplex Receiver," IEEE WCNC 2017, San Francisco, March 2017
- [6] J. Park, S. Yun, and J. Ha, "Detection of Pilot Contamination Attack in the MU-MISOME Broadcast Channels," IEEE ICTC 2016, Jeju, Oct. 2016
- [7] S. Lee, D. Kim, and J. Ha, "A Paired-Page Reading Scheme for NAND Flash Memory," IEEE ICTC 2016, Jeju, Oct. 2016
- [8] D. Kim, K. Oh, D. Kim, and J. Ha, "Information Set Analysis of Polar Codes," IEEE ICTC 2016, Jeju, Oct. 2016
- [9] D. Kim, S. Jeong, and J. Ha, "On the Channel Quantization for NAND Flash Memories," NVWM 2016, San Diego, USA, Mar. 2016
- [10] D. Kim, and J. Ha, "Serial Quasi-Primitive BC-BCH Codes for NAND Flash Memories," IEEE ICC 2016, Kuala Lumpur, Malaysia, May 2016
- [11] S. Yun, J. Ha, and B. Kwak, "Robustness of Biologically Inspired Pulse-Coupled Synchronization against Static Attacks," IEEE GLOBECOM 2015, San Diego, Dec. 2015
- [12] S. Im, J. Choi, and J. Ha, "Secret Key Agreement for Massive MIMO Systems with Two-Way Training Under Pilot Contamination Attack," IEEE GLOBECOM 2015, San Diego, Dec. 2015
- [13] J. Choi, and J. Ha, "Power Allocation of Random Masked Beamforming for Guaranteed Secure Communications," IEEE ICTC 2015, Jeju, Oct. 2015 (*Best Paper Award*)
- [14] S. Lee, J. Lee, and J. Ha, "On Interleaver Design for BICM System with Low Error-Floors," IEEE ICTC 2015, Jeju, Oct. 2015
- [15] D. Kim, and J. Ha, "A Low-Complexity Decoding Algorithm for Concatenated Tree Codes," IEEE ICTC 2015, Jeju, Oct. 2015
- [16] D. Kim, J. Moon, and J. Ha, "A Strong Hard-Decision Error-Correcting Code for NAND Flash Memories: Quasi-Primitive Block-wise Concatenated BCH Codes," NVWM 2015, San Diego, USA, Mar. 2015
- [17] D. Kim, and J. Ha, "Quasi-Primitive Block-wise Concatenated BCH Codes for NAND Flash Memories," IEEE ITW 2014, Hobart, Tasmania, Australia, Nov. 2014
- [18] S. Yun, J. Baek, S. Im, and J. Ha, "Secure Code Design for Near Field Communications," IEEE ICTC 2014, Busan, Korea, Oct. 2014
- [19] Y. Hong, S. Im, and J. Ha, "Secure Antenna Subset Modulation with Coordinate Interleaved Orthogonal Designs," IEEE ICTC 2014, Busan, Korea, Oct. 2014
- [20] J. Choi, and J. Ha, "On the Estimation of Slow-Fading Coefficients for Pilot Contamination Precoding," IEEE VTC 2014, Seoul, Korea, May 2014
- [21] D. Hwang, H. Jeon, J. Ha, J. Choi, "Energy Efficient Transmission Strategies for Distributed Detection in Wireless Sensor Networks," IEEE ISSNIP 2014, Singapore, April. 2014

- [22] W. Shin, J. Lim, W. Noh, K. Jang, S. Yun, J. Baek, and J. Ha, "A Real-Time Implementation of Interference Neutralization for Multi-Source Multi-Hop Wireless Networks," IEEE ICCE 2014, Las Vegas, NV, USA, Jan. 2014
- [23] S. Im, H. Jeon, J. Choi, J. Ha, "Secret Key Agreement under an Active Attack in MU-TDD Systems with Large Antenna Arrays," IEEE GLOBECOM 2013, Atlanta, Dec. 2013
- [24] S. Im, H. Jeon, J. Choi, and J. Ha, "Robustness of Secret Key Agreement Protocol with Massive MIMO under Pilot Contamination Attack," IEEE ICTC 2013, Jeju, Oct. 2013
- [25] J. Choi, H. Jeon, and J. Ha, "Physical Layer Security for Wireless Sensor Networks," IEEE PIMRC 2013, London, Sept. 2013
- [26] H. Jeon, S. W. McLaughlin, and J. Ha, "Secure Communications with Untrusted Secondary Users in Cognitive Radio Networks," GLOBECOM 2012, Anaheim, California, USA, Dec. 2012
- [27] D. Kim, J. Choi, and J. Ha, "On the Soft Information Extraction from Hard-Decision Outputs in MLC NAND Flash Memory," GLOBECOM 2012, Anaheim, California, USA, Dec. 2012
- [28] S. Cho, and J. Ha, "Concatenated BCH Codes for NAND Flash Memories," ICC 2012, Ottawa, Canada, June 2012
- [29] J. Choi, and J. Ha, "Iterative Distributed Amplitude Optimization for Distributed Detection in Wireless Sensor Networks," Vehicular Technology Conference (VTC Spring), 2012 IEEE 75th , Yokohama, Japan, May 2012
- [30] J. Choi, S. Li, X. Wang, and J. Ha, "A General Distributed Consensus Algorithm for Wireless Sensor Networks," Wireless Advanced (WiAd), 2012, London, UK, June 2012
- [31] J. Choi, and J. Ha, "Orthogonal Beamforming for overlay mode of OFDMA-based Rural Broadband Wireless Access," Wireless Communications and Networking Conference (WCNC), 2012, Paris, France, April 2012
- [32] H. Jeon, and J. Ha, "Channel Aware Encryption and Decision Fusion for Wireless Sensor Networks," WIFS'11, Foz do Iguacu, Brazil, Nov. 2011
- [33] M. Hyun, W. Song, J. Choi, S. Yoo, and J. Ha, "Code Design for Type-I Wiretap Channel," Allerton Conference on Communication, Control, and Computing, Illinois, USA, Sept. 2011
- [34] H. Jeon, S. W. McLaughlin, and J. Ha, "Cooperative Secure Transmission for Distributed Detection in Wireless Sensor Networks," IEEE MWSCAS'11, Seoul, Korea, Aug. 2011
- [35] J. Choi, and J. Ha, "MMSE-based distributed beamforming in cooperative relay networks," IEEE MWSCAS'11, Seoul, Korea, Aug. 2011
- [36] J. Nam, G. Caire, and J. Ha, "Block Triangularization: A New Linear Precoding Strategy for Gaussian MIMO BC," IEEE ISIT'11, pp.1733-1737, St. Petersburg, Russia, Aug. 2011
- [37] C. Jung, D. Jun, J. Oh, H. Park, and J. Ha, "Region-of-Interest based pixel domain Wyner-Ziv coding," IEEE MILCOM'10, vol., pp.283-286, San Jose, CA, USA, Oct. 2010
- [38] J. Nam, J. Ha, and J. Ahn, "A New Linear Precoding Strategy for MIMO BC," IEEE GLOBECOM 2010, Miami, USA, Dec. 2010
- [39] H. Jeon, J. Choi, H. Lee, and J. Ha, "Channel-aware energy efficient transmission strategies for large wireless sensor networks," IEEE GLOBECOM 2010, Miami, USA, Dec. 2010
- [40] J. Choi, and J. Ha, "On the Asymptotic Performance of TBMA with Multichannel Diversity over Fading Channels," IEEE PIMRC 2010, Istanbul, Turkey, Sept. 2010
- [41] H. Jeon, D. Hwang, J. Choi, H. Lee, and J. Ha, "Secure type-based multiple access: transmission strategy and analysis for perfect secrecy," IEEE ITW 2010, Dublin, Ireland, Aug. 2010
- [42] H. Jeon, N. Kim, J. Choi, H. Lee, and J. Ha, "On multiuser secrecy rate in flat fading channel," MILCOM'09, pp. 1-7, Boston, MA, USA, Oct. 2009
- [43] D. Klinc, J. Ha, S. W. McLaughlin, J. Barros, and B. Kwak, "LDPC Codes for the Gaussian Wiretap Channel," ITW'09, pp. 95-99, Taormina, Italy, Oct. 2009
- [44] D. Klinc, J. Ha, S. W. McLaughlin, J. Barros, and B. Kwak, "LDPC for Physical Layer Security," GLOBECOM'09, pp. 1-6, Hawaii, USA, Nov. 2009
- [45] M. Kim, M. Hyun, J. Ha, and H. Oh, "On enhancement of error detection capability of WAVE

- standard," 16th World Congress on ITS, Stockholm, Sweden, Sept. 2009
- [46] H. Jeon, N. Kim, M. Kim, H. Lee, and J. Ha, "Secrecy capacity over correlated ergodic fading channel," MILCOM'08, pp. 1-7, San Diego, CA, USA, Nov. 2008
- [47] D. Klinc, J. Ha, and S. W. McLaughlin, "Optimized puncturing and shortening distributions for nonbinary LDPC codes over the binary erasure channel," Allerton Conference on Communication, Control, and Computing, pp. 1053-1058, Illinois, USA, Sept. 2008
- [48] J. Nam, S. Kim, and J. Ha, "A New Design of iterative detection and decoding with soft Interference cancellation," VTC'08 fall, pp.1-6, Calgary, Canada, Sept. 2008
- [49] D. Klinc, J. Ha, and S. W. McLaughlin, "On rate-adaptability of nonbinary LDPC codes," in Proc. of the 5th International Symposium on Turbo Codes & Related Topics 2008, pp. 231-236, Lausanne, Switzerland, Sept. 2008
- [50] J. Nam, S. Kim, and J. Ha, "A modified Turbo principle of iterative detection and decoding," ISIT'08, pp.469-473, Toronto, Canada, July 2008
- [51] S. Song, D. Hwang, S. Seo, and J. Ha, "Linear-time encodable rate-compatible punctured LDPC codes with low error floors," VTC'08, pp. 749-753, Singapore, May 2008
- [52] S. Oh, A. Fayziyev, J. Cha, J. Ha, and S. Kim, "A new efficient 16-QAM mapping approach for iterative receiver using Turbo codes over SISO channel," ICACT 2008, vol.1, pp.421-423, Phoenix Park, Korea, Feb. 2008
- [53] J. Nam, S. Kim, H. Chung, J. Choi, and J. Ha, "Cholesky based efficient algorithms for the MMSE-SIC receiver," GLOBECOM'07, pp.3045-3050, Washington DC, USA, Nov. 2007
- [54] J. Kwon, D. Klinc, J. Ha, and S. W. McLaughlin, "Fast decoding of rate-compatible punctured LDPC codes," ISIT2007, pp.216-220, Nice, France, June 2007
- [55] D. Shin, K. Heo, S. Oh, and J. Ha, "A stopping criterion for low-density parity-check codes," VTC'07 Spring, pp.1529-1533, Dublin, Ireland, April 2007
- [56] K. Chang, Y. Han, J. Ha, and Y. Kim, "Cancellation of ICI by Doppler effect in OFDM systems," VTC'06 Spring, pp. 1411-1415, Melbourne, Australia, May 2006
- [57] D. Klinc, J. Ha, J. Kim, and S. W. McLaughlin, "Rate-compatible punctured low-density parity-check codes for ultra-wide band systems," GLOBECOM'05, pp. 3856-3860, St. Louis, USA, Nov. 2005
- [58] J. Ha, J. Kim, and S. W. McLaughlin, "Puncturing for finite length low-density parity-check codes," ISIT2004 Linear-time encodable rate-compatible, p. 151, Chicago, USA, July 2004
- [59] J. Ha, and S. W. McLaughlin, "Optimal puncturing distributions for rate-compatible low-density parity-check codes," ISIT2003, p. 233, Yokohama, Japan, July 2003
- [60] J. Ha, and S. W. McLaughlin, "Optimal puncturing of irregular low-density parity-check codes," ICC2003, vol. 5, pp. 3110-3114, 2003, Anchorage, USA, May 2003
- [61] J. Ha, and S. W. McLaughlin, "Analysis and design of LDPCs over Gaussian channels with erasures," ISIT2002, p. 30, Lausanne, Switzerland, July 2002
- [62] J. Ha, A. N. Mody, J. Sung, J. R. Barry, S. W. McLaughlin, and G. L. Stuber, "LDPC Coded OFDM with Alamouti/SVD Diversity Technique," WPMC01, pp. 1345-1350, Aalborg, Denmark, Step. 2001

Books (chapter)

Demijan Klinc, Jeongseok Ha, Steven McLaughlin, Joas Barros, and Byung-Jae Kwak, "LDPC Codes for Gaussian Wiretap Channel," in Physical Layer Security in Wireless Communications, X. Zhou, L. Song and Y. Zhang, Eds. CRC Press, 2014, pp. 33-45.

Patents

- [1] Encoding, Decoding, and Multi-Stage Decoding Circuits and Methods for Concatenated BCH Code, Error Correct Circuit of Flash Memory Device using the Same, and Flash Memory Device using the Same, Patent Number: US 9,166,626, Issue Date: 2015-10-20
- [2] Secure Communication using Non-Systematic Error Control Codes, "Application Number :

13/123,669, Application Date : 2009-10-08, Patent Number: US 8,667,380 B2, Issue Date: 2014-03-04"

- [3] Channel Encoding Apparatus and Method, US Patent, Patent Number: 7818650, Issue Date: 2010-10-19
- [4] Method for Puncturing an LDPC channel Code, US Patent, Patent Number: 7657824, Issue Date: 2010-02-02
- [5] Channel Encoding Apparatus and Method, US Patent, Patent Number: 7451385, Issue Date: 2008-11-11
- [6] Method for Puncturing an LDPC channel Code, German, French Patent, Patent Number: 1653629, Issue Date: 2008-02-20

Awards and Honors

- International Conference on ICT Convergence (ICTC) 2105 Best Paper Award
- SK-Hynix Outstanding Patent Award 2015
- One of the 10 Outstanding Research Achievements in School of Electrical Engineering, 2015
- Outstanding Research Award, Basic Science Research Program Korea Research Foundation (KRF), 2014
- Two of his Publications Are Selected As "Best Readings in Communications and Information Systems Security 2013 by IEEE COMSOC"
- Exemplary Reviewer (within best 3% reviewers) in IEEE Communications Letters, 2012
- Outstanding Research Achievements (within top 15%), Basic Science Research Program Korea Research Foundation (KRF), 2012
- Best Teaching Award, Fall Semester; 2012

Membership and Services

- Secretary of IEEE ComSoc Data Storage Technical Committee, since 2017
- Co-Chair of IEEE ComSoc Data Storage Technical Committee Award Committee, 2016
- Member of Technical Advisory Committee of Patent Court of Korea since 2015
- Member of Communications, Signal Processing, and Information Theory societies in Institute of Electric and Electronic Engineers (IEEE) since 2003
- Life Member of Korea Information and Communications (KIC)
- Life Member of Institute of Electronics Engineers of Korea (IEEK)
- Executive Member of the Korea Institute of Communications and Information Sciences (KICS)
- Member of Technical Program Committee of APCC 2013, 2016
- Member of Technical Program Committee of GLOBECOM 2011 – 2018
- Member of Technical Program Committee of ICC 2013 – 2018
- Member of Technical Program Committee of PIMRC 2015
- Member of Technical Program Committee of APWiMob 2015 - 2016
- Member of Technical Program Committee of ISCI 2009-2013
- Member of Technical Program Committee of ICTC 2012, 2013
- Member of Technical Program Committee of TENCON 2012
- Member of Technical Program Committee of ICUFN 2014 - 2016
- Member of Technical Program Committee of ATC 2014, 2015
- Member of Technical Program Committee of COMNETSAT 2014
- Member of Technical Program Committee of ISCIT 2009
- Member of Technical Program Committee of ICCVE 2013
- Member of Technical Program Committee of VTC2012 Spring, 2014 Spring and Fall
- Member of Organizing Committee of International Symposium on Information Theory (ISIT) 2009, Seoul Korea

- Member of Organizing Committee of International Symposium on Communications and Information Technologies (ISCIT) 2009, Incheon Korea
- Member of Organizing Committee of Joint Conference on Communications and information (JCCI), 2010, and 2013 Korea
- Member of Steering Committee of Joint Conference on Communications and Information (JCCI)

Invited Talks

- A Strong Hard-Decision Error-Correcting Code for NAND Flash Memories: Quasi-Primitive Block-wise Concatenated BCH Codes, Broadcom, USA, Mar. 2016
- A Strong Hard-Decision Error-Correcting Code for NAND Flash Memories: Quasi-Primitive Block-wise Concatenated BCH Codes, Huawei, USA, Mar. 2016
- Introduction To Physical Layer Security, Electronics and Telecommunications Research Institute (ETRI), June 2014
- Block-wise Concatenated Codes for NAND Flash Memories, SK HMS, USA, Aug. 2013
- Block-wise Concatenated Codes for NAND Flash Memories, LSI Logic, USA, Aug. 2013
- On the Design of Secure Codes at Finite Lengths for Wiretap Channels, POSTECH, Sept., 2012
- On the Design of Secure Codes at Finite Lengths for Wiretap Channels, Tohoku University, Sendai, Japan, Aug. 2012
- On the Design of Secure Codes at Finite Lengths for Wiretap Channels, University of Ottawa, Canada, June, 2012
- On the Design of Secure Codes at Finite Lengths for Wiretap Channels, Georgia Institute of Technology, USA, June, 2012
- On the Design of Secure Codes at Finite Lengths for Wiretap Channels, Samsung Advanced Institute of Technology, June 2012
- Error-Control Codes for NAND flash Memories, Samsung Semiconductor, Dec. 2011
- Secure Type-Based Multiple-Access, SOIM-GCOE, Tohoku University, 2010
- Rate-Compatible Punctured Low-Density Parity-Check Codes and Their Applications, Seoul National University (SNU), May 2006
- Wireless Communications and CDMA Systems, Korea Telecom, Nov. 2005
- Channel Coding and Applications, Electronics and Telecommunications Research Institute (ETRI), Nov. 2005
- Introduction to Channel Coding, Electronics and Telecommunications Research Institute (ETRI), Oct. 2015
- Error Control Codes for Future Wireless Communications: Rate-adaptive Low-density Parity-Check Code, 4G Workshop, Dec. 2004