

Hye Won Chung

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EMPLOYMENT

KAIST	Daejeon, South Korea
<i>Assistant Professor</i>	Jun. 2017–present
University of Michigan	Ann Arbor, MI
<i>Research Fellow</i>	Aug. 2014–May 2017

EDUCATION

Massachusetts Institute of Technology	Cambridge, MA
Ph.D. in Electrical Engineering and Computer Science.	June 2014
Thesis: “Extracting Classical Information from Quantum States: Fundamental Limits, Adaptive and Finite-Length Measurements.”	
Advisor: Prof. Lihong Zheng	
M.S. in Electrical Engineering and Computer Science.	Sept. 2009
Thesis: “An Energy-Efficient AES Engine with DPA Attack-Resistance.”	
Advisor: Prof. Anantha Chandrakasan	
Korea Advanced Institute of Science and Technology	Daejeon, South Korea
B.S. in Electrical Engineering and Computer Science, <i>summa cum laude</i> .	Aug. 2007

RESEARCH INTERESTS

Statistical Inference, Information Theory, Data Science, Machine Learning, Coding Theory, Quantum Information Theory, Quantum Optical Communications.

PUBLICATIONS

Journal Articles

- J1. H. W. Chung, J. O. Lee and A. Hero, “Fundamental Limits on Data Acquisition: Trade-offs between Sample Complexity and Query Difficulty,” submitted. arXiv: 1712.00157.
- J2. H. W. Chung, B. Sadler, L. Zheng and A. Hero, “Unequal Error Protection Querying Policies for the Noisy 20 Questions Problem,” *IEEE Transactions on Information Theory*, vol. 64, no. 2, pp. 1105–1131, Feb. 2018.
- J3. H. W. Chung, B. Sadler and A. Hero, “Bounds on Variance for Symmetric Unimodal Distributions,” *IEEE Transactions on Information Theory*, vol. 63, no. 11, pp. 6936–6949, Nov. 2017.
- J4. H. W. Chung, S. Guha and L. Zheng, “Capacity of Optical Communications over a Lossy Bosonic Channel with a Receiver Employing the Most General Coherent Electro-Optic Feedback Control,” *Physical Review A*, vol. 96, 012320, Jul., 2017.
- J5. H. W. Chung, S. Guha and L. Zheng, “Superadditivity of Quantum Channel Coding Rate with Finite Blocklength Quantum Measurements,” *IEEE Transactions on Information Theory*, vol. 62, no. 10, pp. 5938–5959, Oct., 2016.

Conference Papers

- C1. H. W. Chung, J. O. Lee and A. Hero, “Fundamental Limits on Data Acquisition: Trade-offs between Sample Complexity and Query Difficulty,” in *Proc. of IEEE International Symposium on Information Theory (ISIT)*, Vail, CO, USA, Jun. 2018.
- C2. H. W. Chung, L. Zheng, B. Sadler and A. Hero, “Unequal Error Protection Coding Approaches to the Noisy 20 Questions Problem,” in *Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Calgary, Canada, Apr. 2018.
- C3. H. W. Chung, L. Zheng, B. Sadler and A. Hero, “Unequal Error Protection Coding Approaches to the Noisy 20 Questions Problem,” in *Proc. of IEEE International Symposium on Information Theory (ISIT)*, pp. 1700–1704, Barcelona, Spain, July 2016.
- C4. H. W. Chung, B. Sadler and A. Hero, “Bounds on Variance for Symmetric Unimodal Distributions,” in *Proc. of 53rd IEEE Allerton Conference on Communication, Control, and Computing*, pp. 1235–1240, Monticello, IL, USA, Oct. 2015.
- C5. H. W. Chung, S. Guha and L. Zheng, “Superadditivity of Quantum Channel Coding Rate with Finite Blocklength Quantum Measurements,” in *Proc. of IEEE International Symposium on Information Theory (ISIT)*, pp. 901–905, Hawaii, USA, July 2014.
- C6. H. W. Chung, S. Guha and L. Zheng, “Superadditivity of Quantum Channel Coding Rate with Finite Blocklength Quantum Measurements,” *17th Conference on Quantum Information Processing (QIP)*, Barcelona, Spain, Feb. 2014 (poster).
- C7. H. W. Chung and L. Zheng, “Superadditivity of Quantum Channel Coding Rate with Finite Blocklength Quantum Measurements,” in *Proc. of 51st IEEE Allerton Conference on Communication, Control, and Computing*, pp. 810–817, Monticello, IL, USA, Oct. 2013.
- C8. H. W. Chung, S. Guha and L. Zheng, “On Capacity of Optical Channels with Coherent Detection,” in *Proc. of 49th IEEE Allerton Conference on Communication, Control, and Computing*, pp. 879–885, Monticello, IL, USA, Sep. 2011 (invited paper).
- C9. H. W. Chung, S. Guha and L. Zheng, “On Capacity of Optical Channels with Coherent Detection,” in *Proc. of IEEE International Symposium on Information Theory (ISIT)*, pp. 284–288, St. Petersburg, Russia, Aug. 2011.
- C10. H. W. Chung, S. W. Jeon, D. H. Park and S. Y. Chung, “Joint Determination of Power and Decoding Order for Successive Inter- and Intra-Cell Interference Cancellation,” in *Proc. of IEEE International Conference on Advanced Communication Technology (ICACT)*, pp. 1482–1486, Korea, Feb. 2007.
- C11. H. W. Chung, E. J. Hong, K. L. Kim and S. H. Cho, “Optimum Supply Voltage and Sleep Transistor Sizing for Energy Minimization in Latency-Constrained MTCMOS Circuits,” in *Proc. of International SoC Design Conference (ISOCC)*, Korea, 2006.

TALKS

Invited Talks

<i>Information Theory meets Big Data.</i>	
The 28th Conference on Communications and Information (tutorial)	May 2018
<i>Quantum May Solve Challenges in Data Science.</i>	
Quantum AI Mini Symposium (KAIST)	Dec. 2017
<i>Value of Information in Data Science.</i>	
Hong Kong University of Science and Technology (HKUST)	Feb. 2017
Korea Advanced Institute of Science and Technology (KAIST)	Feb. 2017
<i>Value-Centered Information Extraction for Noisy 20 Questions Problem.</i>	
Daegu Gyeongbuk Institute of Science and Technology (DGIST)	Aug. 2016

SPEECS seminar, University of Michigan	Apr. 2016
U.S. Army Research Laboratory	Mar. 2016
Korea Advanced Institute of Science and Technology (KAIST)	Sep. 2015
<i>Extracting Classical Information from Quantum States: Fundamental Limits, Adaptive and Finite-Length Measurements.</i>	
Systems Science Seminar, University of Michigan	Jun. 2014
<i>Superadditivity of Quantum Channel Coding Rate with Finite Blocklength Measurements.</i>	
Raytheon BBN Technologies	Sep. 2013
DARPA review meeting, MIT	Mar. 2013
<i>Subspace Receiver for Quantum Hypothesis Testing.</i>	
DARPA review meeting, MIT	Sep. 2012
<i>Quantum-Enhanced Direct Detection.</i>	
DARPA review meeting, MIT	Mar. 2012

Conference Talks

2018 IEEE International Symposium on Information Theory (CO, USA)
2018 IEEE International Conference on Acoustics, Speech, and Signal Processing (Canada)
2016 IEEE International Symposium on Information Theory (Barcelona, Spain)
2015 IEEE Allerton Conference on Communication, Control, and Computing (IL, USA)
2014 IEEE International Symposium on Information Theory (HI, USA)
2013 IEEE Allerton Conference on Communication, Control, and Computing (IL, USA)
2011 IEEE International Symposium on Information Theory (Saint Petersburg, Russia)

TEACHING

Korea Advanced Institute of Science and Technology

- EE326 Introduction to Information Theory and Coding Spring 2018
- 43 students
- EE623 Information Theory Fall 2017
- 37 students, evaluation rating 4.49/5.0 (*Departmental Outstanding Teaching Award*)

Massachusetts Institute of Technology

- Teaching Assistant, 6.437 Inference and Information Spring 2012
- Research Science Institute Mentor Summer 2011
Residential science enrichment program at MIT for high-performing high school students
- Guest Lecturer, 6.451 Principles of Digital Communication II Fall 2010
"Channel Polarization and Polar Codes"

AWARDS AND HONORS

Departmental Outstanding Teaching Award, KAIST	Fall, 2017
Kwanjeong Educational Foundation Scholarship (\$50k funding per year)	2007-2013
First rank of the Undergraduate Research Participation Program, KAIST	2006
Kwanjeong Educational Foundation Undergraduate Scholarship	2005-2006
Korea Research Foundation Undergraduate Scholarship	2005

RESEARCH GRANTS

National Research Foundation (Basic Science and Engineering) Nov. 2017- Oct. 2021
“Value-centered Big Data Acquisition and Processing” PI

Samsung Electronics Jun. 2018- May 2021
“Developing Computationally-Efficient Algorithms for Ultra Low-Power AI Processors” PI

PROFESSIONAL ACTIVITIES

Journal and Conference Reviewing

IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE Transactions on Wireless Communications, IEEE Journal of Selected Topics on Signal Processing, IEEE International Symposium on Information Theory (ISIT), Neural Information Processing Systems (NIPS).

Event Organizations

Shannon Centennial Symposium at the University of Michigan Sep. 2016

Membership

IEEE, IEEE Information Theory Society, IEEE Signal Processing Society