Minoh Jeong

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Education

University of Minnesota - Twin Cities — **Minneapolis, MN**
Ph.D. student in Electrical Engineering — *Aug. 2019 – Present*
- Advisor: Prof. Martina Cardone

Ajou University — **Suwon, Korea**
M.S in Electrical and Computer Engineering — *Mar. 2017 – Feb. 2019*
- Advisor: Prof. Songnam Hong
- Thesis: Efficient decoding methods for polar codes

Inha University — **Incheon, Korea**
B.S in Electronic Engineering — *Mar. 2011 – Feb. 2017*

Research Interest

Statistical Signal Processing, Differential Privacy, Machine Learning, Optimization, Coding Theory, Information Theory.

Publications

Journal Articles

1. **M. Jeong**, A. Dytso and M. Cardone, "Ranking Recovery under Privacy Considerations," in *Transactions on Machine Learning Research*, July 2022.
2. **M. Jeong**, A. Dytso, M. Cardone and H. V. Poor, "Recovering Data Permutations From Noisy Observations: The Linear Regime," in *IEEE Journal on Selected Areas in Information Theory*, vol. 1, no. 3, pp. 854-869, Nov. 2020, doi: 10.1109/JSAIT.2020.3041697.
3. **M. Jeong,** A. Dytso and M. Cardone, "Gradient of Error Probability of M-ary Hypothesis Testing Problems Under Multivariate Gaussian Noise," *IEEE Signal Processing Letters*, vol. 27, pp. 1909-1913, 2020, doi: 10.1109/LSP.2020.3031487.
4. **M.-O. Jeong** and S.-N. Hong, "SC-Fano Decoding for Polar Codes," *IEEE Access*, vol. 7, pp. 81682-81690, June 2019, doi: 10.1109/ACCESS.2019.2924016.
5. S.-N. Hong and **M.-O. Jeong**, "An Efficient Construction of Rate-Compatible Punctured Polar (RCPP) Codes Using Hierarchical Puncturing," in *IEEE Transactions on Communications*, vol. 66, no. 11, pp. 5041-5052, Nov. 2018, doi: 10.1109/TCOMM.2018.2854183.

International Conference Proceedings

1. **M. Jeong**, M. Cardone and A. Dytso, "On the Ranking Recovery from Noisy Observations up to a Distortion," in *2022 IEEE International Symposium on Information Theory (ISIT)*, Finland, June 2022.
2. M. Kim, **M. Jeong**, M. Cardone and J. Choi, "Characterization of the Quality Factor in Spiral Coil Designs for High-Frequency Wireless Power Transfer Systems using Machine Learning," in *2022 IEEE 23rd Workshop on Control and Modeling for Power Electronics (COMPEL)*, 2022, pp. 1-8.
3. **M. Jeong,** A. Dytso and M. Cardone, "Retrieving Data Permutations from Noisy Observations: High and Low Noise Asymptotics," in *2021 IEEE International Symposium on Information Theory (ISIT)*, Melbourne, Victoria, Australia, July 2021.
4. **M. Jeong,** A. Dytso, M. Cardone and H. V. Poor, "Recovering Structure of Noisy Data through Hypothesis Testing," in *2020 IEEE International Symposium on Information Theory (ISIT)*, Los Angeles, CA, July 2020, pp. 1307-1312, doi: 10.1109/ISIT44484.2020.9174229.
5. **M.-O. Jung** and S.-N. Hong, "Construction of Rate-Compatible Punctured Polar Codes Using Hierarchical Puncturing," in *2018 IEEE International Symposium on Information Theory (ISIT)*, Vail, CO, June 2018, pp. 1859-1863, doi: 10.1109/ISIT.2018.8437536.

Poster Presentations

1. **M. Jeong,** "Permutation Recovery by Linear Decoding: Optimality and Asymptotics ," in *2021 IEEE North American School of Information Theory (NASIT)*, Online, June 2021.

Experience

Research Assistant

University of Minnesota - Twin Cities **Minneapolis, MN**
Research Assistant, Dept of CSE *Aug. 2019 – Present*
- Research on Noisy Order Statistics
- Research on Optimization
- Research on Differential privacy

Ajou University **Suwon, Korea**
Research Assistant, Information System Lab., Dept of ECE *Mar. 2017 – Feb. 2019*
- Research on Coding Theory (Polar codes)
- Research on Machine/Deep Learning for Wireless Communication

Research Project

Recovering Data Permutations From Noisy Observations
Research assistant *Sep. 2019 – present*
- Research on optimality of permutation estimator
- Research on differential privacy

Future Combat Network Technology Research
Research assistant *Dec. 2017 – Feb. 2019*
- Supported by Defense Acquisition Program Administration (DAPA), Agency for Defense Development (ADD)
- Research on Polar code decoder
- Research on Deep Neural Network onto Polar Code Decoder to decrease latency

Polar Codes for 5G Communication Systems
Research assistant *Mar. 2017 – Dec. 2017*
- Supported by LG Electronics
- Research on Advanced Coding Theory: 5G channel coding (Efficient Polar Code Decoder / Puncturing Pattern)

Coded Distributed Computing Systems for Big Data Processing
Research assistant *Mar. 2017 – Dec. 2017*
- Supported by National Research Foundation (NRF)
- Research on Coded Distributed Computing System

Teaching Assistant

Electronic Circuits **Ajou university, Korea**
Teaching instruction of PSPICE *Sep. 2018 – Dec. 2018*

Electromagnetics **Ajou university, Korea**
Answered questions about quiz and assignments *Mar. 2018 – June 2018*

Probability and Random Variable **Ajou university, Korea**
Answered questions about probabilistic problems, and proctored exams *Sep. 2017 – Dec. 2017*

Mobile Communications System **Ajou university, Korea**
Coached students in building MATLAB simulation *Mar. 2017 – June 2017*

Work

ROMAD (Radio Operator Maintainer and Driver) **Republic of Korea Air Force**
Staff sergeant *Mar. 2012 – Mar. 2014*
- Squad leader
- Operation on the radio system to help tactical vehicles communicate with combat planes
- Worked on driving Tactical Vehicles

Course Works

Information / Communication theory

Information Theory, Error Correcting Codes (Polar/LDPC codes), Advanced Communication, Advanced Digital Communication (MIMO), Signal and System

Mathematics / Statistics

Optimization for Machine learning, Optimization Theory, Estimation Theory, Probability and Stochastic Process, Theory of Statistics 1 & 2, Applied Multivariate Methods, Categorical Data Analysis, Linear Algebra

Computer Science

Deep Learning with Spatial data, Machine Learning: Foundation and Analysis, Advanced Machine Learning, Machine Learning (in Coursera), Algorithm

Technical Skills

Programming Languages: MATLAB, Python, R, Julia
Machine Learning / Big Data: PyTorch, Tensorflow, PySpark, SQL
Tools: LaTex

Honors and Awards

Winner of ISIT 2020 Student Video Exposition, IEEE, https://youtu.be/M9GjCSUUM5A, 2020