

KYUNGBOK LEE

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PROFESSIONAL APPOINTMENTS

Postdoctoral Researcher

Apr. 2024 - Present

Graduate School of Data Science, Seoul National University

Mentor: Min-hwan Oh, Ph.D.

EDUCATION

Seoul National University

Mar. 2018 - Feb. 2024

Ph.D. in Statistics

Advisor: Myunghee Cho Paik, Ph.D.

Dissertation: Application of Statistical Methods in Contextual Bandits and Reinforcement Learning

Seoul National University

Mar. 2013 - Aug. 2017

Double Major

Graduated with Honors (Summa Cum Laude)

B.S. in Mathematical Sciences

B.S. in Statistics

HONORS & AWARDS

3rd Prize, Student Paper Competition

Dec. 2022

Korean Statistical Society

1st Prize, Big Contest (Data Analysis Competition)

Minister's Award from the

Korean Ministry of Science and Information and Communications Technology

Nov. 2019

National Information Society Agency of Korea

Brain Korea 21 Plus Scholarship

Sep. 2023 - Feb. 2024

National Research Foundation of Korea

Scholarship for Next Academic Generation in the Field of Basic Science

Mar. 2018 - Feb. 2021

Seoul National University

Presidential Science Scholarship of Korea Student Aid Foundation

Mar. 2013 - Feb. 2017

Korea Student Aid Foundation

PUBLICATIONS & PREPRINTS

∗: First author; ‡: Corresponding author

Journal

- Kim, Y.-g.[∗], Lee, K., and Paik, M.C.[‡] (2022). Conditional Wasserstein generator. *IEEE Transactions on Pattern Analysis and Machine Intelligence*. [Paper] [Code]
- **Top 1** Applied Mathematics journal (H-index: 397; upper 0.2%)
- Lee., J.-S., Han., D., Kim., S.Y., Hong., K.H., Jang., M.-j., Kim., M.J., Kim., Y.-g., Park., J.H., Cho., S.I., Park., W.B., Lee, K., Shin., H.S., Oh., H.S., Kim., T.S., Park., S.S., and Seong., M.-W.[‡] (2021). Longitudinal proteomic profiling provides insights into host response and proteome dynamics in COVID-19 progression. *Proteomics*. [Paper]
- Lee., J.-S., Lee, K., Song., H., Sun., C., Kim., M.J., Cho., S.I., Lee., Y.K., Park., S.S., and Seong., M.-W.[‡] (2021). Noninvasive prenatal test of single-gene disorders by linked-read direct haplotyping: application in various diseases. *European Journal of Human Genetics*. [Paper]

- Lee., J.-S., **Lee, K.**, Song., H., Sun., C., Kim., M.J., Cho., S.I., Lee., Y.K., Park., S.S., and Seong., M.-W.[‡] (2020). Direct haplotyping-based noninvasive prenatal test for myotonic dystrophy type 1 with large CTG expansion. *Clinical Chemistry*. [\[Paper\]](#)
- **Top 2** Biochemistry (medical) journal (H-index: 235)

Peer-reviewed Conference

- **Lee, K.***, Paik, M.C., Oh, M.-h., and Kim, G.-S.[‡] (2024). Mixed-Effects Contextual Bandits. *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2024)*. [\[Paper\]](#) [\[Code\]](#)
- **Top 4** AI conference (H5-index: 212)
- Kim, W.*, **Lee, K.**, and Paik, M.C.[‡] (2023). Double Doubly Robust Thompson Sampling for Generalized Linear Contextual Bandits. *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2023)*. [\[Paper\]](#) - **Top 4** AI conference (H5-index: 212)

Patents

- Paik, M.C.[‡], Kim, Y.-G., and **Lee, K.**, Method and apparatus for conditional data generation using conditional Wasserstein generator. Republic of Korea Patent. [\[Info\]](#)

Preprints

- **Lee, K.***, and Paik, M.C.[‡] (2024). Doubly-Robust Off-Policy Evaluation with Estimated Logging Policy. [\[ArXiv\]](#)
- Kim., Y.-g., **Lee, K.**, Choi., Y., Won., J.-H., and Paik., M.C.[‡] (2023). Wasserstein geodesic generator for conditional distributions (under *Major Revision* at Journal of Machine Learning Research). [\[ArXiv\]](#)[\[Code\]](#)

PROGRAMMING SKILLS

Python

- Experienced in implementing bandit algorithms and various machine learning techniques, including medical data analysis, starting from ground-up coding.
- Skilled in utilizing machine learning and deep learning libraries such as `scipy` and `torch` for effective implementation.
- Conducted recitations on statistical learning and bandit algorithms using `Python` as part of a graduate course.

R

- Capable of utilizing a variety of statistical libraries in R for specific statistical analysis methods.
- Experienced in statistical analysis and data visualization using R.

PRESENTATIONS

Invited Presentations

- (Scheduled) **Lee, K.**, Paik, M.C., Oh, M.-h., Kim, and G.-S., Kim. (2024). Mixed-Effects Contextual Bandits. *INFORMS Annual Meeting 2024, Seattle, WA*.
- (Scheduled) **Lee, K.**, Paik, M.C., Oh, M.-h., Kim, and G.-S., Kim. (2024). Contextual Bandit Algorithm with Multiple Stochastically Correlated Outcomes. *The 2024 International Chinese Statistical Association (ICSA) Applied Statistics Symposium, Nashville, TN*.
- Kim, W., **Lee, K.**, and Paik, M.C. (2022). Doubly Robust Thompson Sampling for Generalized Linear Contextual Bandits. *Kakao Enterprise Tech Talk, Seongnam, Republic of Korea*.

Contributed Presentations

- Kim, W., **Lee, K.**, and Paik, M.C. (2023). Double Doubly Robust Thompson Sampling for Generalized Linear Contextual Bandits.[†] *AI Graduate School Symposium 2023, Seoul, Republic of Korea*.
- **Lee, K.**, Paik, M.C., Oh, M.-h., Kim, and G.-S. (2022). Mixed-Effects Contextual Bandits. *Winter Korea Statistical Conference 2022, Jeju, Republic of Korea*.

- Kim, W., Lee, K., and Paik, M.C. (2021). Doubly Robust Thompson Sampling for Generalized Linear Contextual Bandits. *Fall Artificial Intelligence Institute Retreat 2021, Seoul, Republic of Korea*.

† indicates a poster presentation.

RESEARCH EXPERIENCE

I participated in the following projects as a **research scientist**.

- **Efficient Molecular Generation Utilizing Hierarchical Structure and Latent Representations** *Apr. 2024 - Present*
Funded by National Research Foundation of Korea
- **Deep learning with incomplete and sequential data: Application to biomedical data** *Mar. 2021 - Feb. 2024*
Funded by National Research Foundation of Korea
- **Research on Scientific Customer Management Strategies through Big Data Industry-Academia Collaboration** *Mar. 2020 - Mar. 2021*
Funded by Mirae Asset Daewoo
- **Estimation of Differential Privacy and Nonparametric Structural Models** *Mar. 2019 - Feb. 2021*
Funded by National Research Foundation of Korea

TEACHING EXPERIENCE

Basic Concepts and Applications of Probability *Spring 2018*
Seoul National University (role: **Teaching Assistant**)

- Course for statistics majors focusing on probability theory and various probability models, random variables, sequences, Markov chains, and Poisson processes.
- Wrote homework problems, held office hours, and graded homework and exams.

Mathematical Statistics 2 *Fall 2018*
Seoul National University (role: **Teaching Assistant**)

- Major core course to provide a deeper understanding of limit distributions, statistical estimation, and statistical inferences.
- Held office hours and graded homework and exams.

Mathematical Statistics 1 *Spring 2019*
Seoul National University (role: **Teaching Assistant**)

- Major core course to focus on conditional probability, stochastic independence, and the distributions of random variables.
- Held office hours and graded homework and exams.

The World of Uncertainty and Statistics *Fall 2019*
Seoul National University (role: **Teaching Assistant**)

- Freshman course to introduce statistics for students with non-statistics major.
- Held office hours and graded homework and exams.

Statistical Theory 1 *Spring 2020*
Seoul National University (role: **Teaching Assistant**)

- Graduate-level course on statistical theory.
- Wrote homework problems, held office hours, and graded homework and exams.

Concepts and Practices in Statistics *Fall 2020*
Seoul National University (role: **Teaching Assistant**)

- Freshman course to introduce statistics.
- Wrote homework problems, held office hours, and graded homework and exams.

Sequential Decision Making and its Applications *Spring 2021, Spring 2022, Fall 2022*
(Seminar in Recent Development of Applied Statistics)[†] *Spring 2023, Fall 2023*
Seoul National University (role: **Teaching Assistant**)

- Graduate-level course on **statistical learning** and **multi-armed bandit algorithms**.

- Wrote homework problems, held office hours, graded homework and exams, and conducted Python recitations for machine learning and multi-armed bandit as in English.

Deep Learning: A Statistical Perspective[†]

Fall 2021

Seoul National University (role: **Teaching Assistant**)

- Graduate-level course on deep learning.
- Held office hours, graded homework and exams, and conducted Python recitations for deep learning in English.

[†] indicates a lecture conducted in English.