KYUNGBOK LEE

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PROFESSIONAL APPOINTMENTS

Postdoctoral Research Associate *Nov. 2024 - Present*
Department of Biostatistics, University of North Carolina at Chapel Hill
Mentor: Michael Kosorok, Ph.D.

Postdoctoral Researcher *Apr. 2024 - Oct. 2024*
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

Award of Excellence in Diagnostic Laboratory Medicine Research *Sep. 2024*
Presented by: Laboratory Medicine Congress & Exhibition (LMCE) - Korean Society for Laboratory Medicine (KSLM)
Title: Development of a Diagnostic Test Method for Prader-Willi Syndrome and Angelman Syndrome Based on Targeted Long-Read Sequencing

3rd Prize, Student Paper Competition *Dec. 2022*
Presented by: Korean Statistical Society
Title: Mixed-Effects Contextual Bandits

1st Prize, Big Contest (Data Analysis Competition) - Minister's Award *Nov. 2019*
Presented by: Korean Ministry of Science and ICT - National Information Society Agency
Title: Two-Track Deep Neural Network Model

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

- **Lee, K.**, Paik, M.C., Oh, M.-h., Kim, and G.-S., Kim. (2024). Mixed-Effects Contextual Bandits. *INFORMS Annual Meeting 2024, Seattle, WA.*
- **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.