Kyeongwon Lee

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Postdoctoral Researcher
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RESEARCH INTEREST

Bayesian Statistics, Asymptotic Statistics, High-Dimensional Statistics, Bayesian Computation, Neural Network, Deep Learning, Uncertainty Quantification.

EDUCATION

Doctor of Philosophy (Ph.D.) in Statistics February 2024
Department of Statistics, Seoul National University, Korea

- Advisor: Professor Jaeyong Lee
- Thesis: Asymptotic analysis of Bayesian neural networks for supervised learning

Bachelor of Science in Mathematics February 2017
Department of Mathematical Sciences, Seoul National University, Korea

Bachelor of Science in Statistics February 2017
Department of Statistics, Seoul National University, Korea

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher August 2024 - Present
Department of Mathematics, University of Maryland, College Park, MD

Postdoctoral Researcher March 2024 - August 2024
Department of Statistics and Data Sciences, Yonsei University, Seoul, Korea

HONOR AND SCHOLARSHIP

2023 T-SM Best Paper Award
IEEE Transactions on Semiconductor Manufacturing, 2023

Award for Excellence in Teaching
Department of Statistics, Seoul National University, 2023
For teaching *Theories of Statistics*

Top Graduate Student Paper Award
Journal of the Korean Statistical Society Summer Conference, 2023

Award for Excellence in Teaching
Department of Statistics, Seoul National University, 2020
For teaching *Mathematical Statistics*

The Next Generation of Academics in the Field of Fundamental Science (학문후속세대 장학금)
Seoul National University, 2019

RESEARCH PAPER

ACCEPTED or PUBLISHED

- K. Lee, S. Jo, **K. Lee**, and J. Lee (2025+). Scalable and optimal Bayesian inference for sparse covariance matrices via screened beta-mixture prior. Bayesian Analysis, Accepted. `https://arxiv.org/abs/2206.12773`.
- **K. Lee**. (2024). Asymptotic analysis of Bayesian neural networks for supervised learning. PhD Thesis.
- S. Park, **K. Lee**, D. Jeong, H. Ko, and J. Lee. (2023). Bayesian nonparametric classification for incomplete data with a high missing rate: an application to semiconductor manufacturing data. *IEEE Transactions on Semiconductor Manufacturing*, 36(2), 170-179.
- K. Kim., M. Ma, and **K. Lee*** (2023). Prediction of spatio-temporal AQI data. *Communications for Statistical Applications and Methods*, 30(2), 119-133.
- **K. Lee***, and J. Lee. (2022). Asymptotic properties for Bayesian neural network in Besov space. *Advances in Neural Information Processing Systems*, 35.
- S. Lee, S. Han, S. Park, **K. Lee**, and J. Lee. (2019). Korean speech recognition using deep learning. *The Korean Journal of Applied Statistics*, 32(2), 213-227.

IN-PREPARATION

- K. Lee, **K. Lee**, K. Lee, and S. Jo (2025+). bspcov: An R Package for Bayesian Sparse Covariance Matrix Estimation. In preparation. (GitHub Repository: `https://github.com/statjs/bspcov`)

CONFERENCE PRESENTATION

- Asymptotic analysis of Bayesian neural networks for supervised learning
  - 2024 Bayesian Young Statisticians Meeting
- Asymptotic properties for Bayesian neural network in Besov space
  - 2022 Thirty-sixth Conference on Neural Information Processing Systems
  - 2022 The Asian Regional Section of the International Association for Statistical Computing Interim Conference (Virtual)
  - 2023 Journal of the Korean Statistical Society Summer Conference
- Comparison of end-to-end deep learning models in Korean speech recognition
  - 2018 Eastern Asia Chapter of the International Society for Bayesian Analysis

TEACHING

Lecture

University of Maryland, College Park 2024 - Present

- STAT410: Introduction to Probability Theory

Humaiin, Korea 2020 - 2022

- Introduction to Data Science

Fastcampus, Korea 2018 - 2019

- Statistical and Bayesian Inference for Machine Learning

Teaching Assistant 2017 - Current

Korea National Open University, Korea

- Bayesian Data Analysis

Seoul National University, Korea

- Statistics
- Statistics Lab
- Mathematical Statistics
- Theories of Statistics
- Advanced Bayesian Statistics

SNU Statistical Research Institute, Korea

- Data Science with R/Python

RESEARCH PROJECT

Asymptotic analysis of deep generative models

This work is joint research with Lizhen Lin, 2024 -.

Asymptotic properties and applications of sparse Bayesian neural networks

This work is joint research with Jaeyong Lee, 2018 -.

Scalable and optimal Bayesian inference for high-dimensional sparse covariance matrices

This work is joint research with Seongil Jo, Kwangmin Lee, Kyoungjae Lee, and Jaeyong Lee, 2023 -.

Bayesian nonparametric classification for incomplete data with a high missing rate

This work is joint research with Daeun Jeong, Heungkook Ko, Sewon Park, and Jaeyong Lee and supported by Samsung Electronics, 2021 - 2023.

Prediction of spatio-temporal air quality index data

This work is joint research with Kyeongeun Kim and Miru Ma, 2021 - 2023.

Korean speech recognition using deep learning

This work is joint research with Suji Lee, Seokjin Han, Sewon Park, and Jaeyong

Lee, 2017 - 2019.

NON-RESEARCH PROJECT

"Statistical/probabilistic research on the risk of defective occurrence during reliability testing and measures to reduce risk by securing additional sampling"
Samsung Electronics Co., Ltd., 2021.

"A Study on the Improvement of Index Preparation Methods for Expansion of Actual Transaction Price Index for the apartment house"
Korea Real Estate Board (한국부동산원), 2020 - 2021.

"De Novo Drug Design Using Deep Generative Models"
This work is presented as a team project of the class 326.739A in the 2018 spring semester and joint work with Seokjin Han, Hyosin Lee, and Seowon Choi, 2018.

SKILLS AND OTHER INFORMATION

Programming Languages
`Python`, `R`, `Julia`, and `C++`.

Technical Skills

- Computational mathematics frameworks (`Rcpp`, `NumPy`, `SciPy` and `JAX`)
- Data analysis and visualization (`dplyr/pandas` and `ggplot2/matplotlib`)
- Deep learning frameworks (`TensorFlow` and `PyTorch`)
- Probablistic programming languages (`BUGS/JAGS`, `Stan` and `Pyro/NumPyro`)
- Documentation (LaTeX) and Web (`HTML`, `CSS` and `JS/React`)
- `Docker`, `Git` and parallel computing.

Operating Systems
`MacOS`, `Windows` and `GNU/Linux (Debian, CentOS, Arch)`.

Extracurricular Activities

- *SNU Computer Study Club (SCSC)* 2022
- *Korean user group for* `Stan` *(Stan Korea)* 2017 - 2020
- *The 58th Student Council of Seoul National University* 2016
- Founder and President of *SNU Industrial Mathematics Club (REPIM)* 2015 - 2016
- Operating Committee of *the 33th Student Council of College of Natural Sciences, Seoul National University* 2014 - 2015

- Founder and President of *the first Student Council of Department of Mathematics, Seoul National University* 2014 - 2015
- *Seoul National University Photography Club (Youngsang)* 2013 - 2018