

Kyusoon Kim

✉ kyusoon.kim@ssu.ac.kr | 🏠 <http://qsoon.github.io> | 🌐 qsoon | in kyusoonkim | 📍 Seoul, Korea

Academic Appointments

Assistant Professor, Soongsil University (Abbr. SSU)

Department of Statistics and Actuarial Science

Seoul, Korea

Sep. 2025 - Current

Education

Seoul National University (Abbr. SNU)

Ph.D. candidate, Statistics

Dissertation title: Dimension Reduction and Feature Extraction of Graph-Valued Data

Advisor: Hee-Seok Oh

Seoul, Korea

Sep. 2020 - Aug. 2025

Seoul National University (SNU)

B.S., Statistics

Seoul, Korea

Mar. 2014 - Feb. 2020

Queen Mary University of London (QMUL)

Summer school student (Course: Practical Machine Learning)

London, England

Jul. 2019 - Aug. 2019

Gyeonggi Science High School (GSHS)

Specialized high school for students talented in math and science

Suwon, Korea

Mar. 2011 - Feb. 2014

Research and Professional Experience

Research Scientist

Sentience Inc.

Gangnam, Korea

Feb. 2020 - Jul. 2020

Participant of Undergraduate Research Internship Program

Bayesian Statistics Lab.

Advisor: Jaeyong Lee

Seoul National University

Sep. 2019 - Feb. 2020

Military Service

R.O.K Armed Forces (Sergeant)

Seongnam, Korea

Jul. 2017 - Apr. 2019

- Served in fulfillment of the mandatory military service duty for Republic of Korea citizens
- Created and improved auto-processing software for data processing using Python

Publications

Published papers

- [1] Kim, K. and Oh, H.-S. (2025+). "Graph frequency-domain factor modeling," *IEEE Transactions on Pattern Analysis and Machine Intelligence*. In press. [\[paper\]](#) [\[code\]](#)
- [2] Kim, K. and Oh, H.-S. (2025). "Cross-spectral analysis of bivariate graph signals," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 47(12), 11141-11151. [\[paper\]](#) [\[code\]](#)
- [3] Kim, K. and Oh, H.-S. (2025). "Quantile-based fitting for graph signals," *Statistics and Computing*, 35(6), 180. [\[paper\]](#) [\[code\]](#)
- [4] Kim, K.[†], Oh, S.[†], Bae, K., and Oh, H.-S. (2025). "Prediction of wafer performance: Use of functional outlier detection and regression," *IEEE Access*, 13, 35298-35308. [\[paper\]](#) [\[code\]](#)
- [5] Kang, S.[†], Kim, K.[†], Kwon, Y.[†], Park, S.[†], Park, S.[†], Shin, H.-Y.[†], Kim, J. and Oh, H.-S. (2025). "Semiparametric approaches for the inference of univariate and multivariate extremes," *Extremes*, 28(1), 123-148. [\[paper\]](#) [\[code\]](#)
- [6] Kim, K. and Oh, H.-S. (2024). "Network time series forecasting using spectral graph wavelet transform," *International Journal of Forecasting*, 40(3), 971-984. [\[paper\]](#) [\[code\]](#)
- [7] Kim, K., Oh, H.-S. and Park, M. (2023). "Principal component analysis for river network data: Use of spatiotemporal correlation and heterogeneous covariance structure," *Environmetrics*, 34(4), e2753. [\[paper\]](#) [\[code\]](#)

Papers under review

[8] **Kim, K.**[†], Park, S.[†], Shin, H.-Y.[†], Choi, J., Ha, J., Kim, J., Kwon, Y., Park, S. and Kang, S. (2025+). “Extremal PCA-based synthetic event generation for the inference of extreme precipitation,” under review at *Extremes*. [\[code\]](#)

[9] **Kim, K.** and Oh, H.-S. (2025+). “Principal component analysis in the graph frequency domain,” under review at *Journal of Multivariate Analysis*. [\[arXiv\]](#) [\[code\]](#)

[10] Cho, H.[†], **Kim, K.**[†] and Oh, H.-S. (2025+). “Statistical graph empirical mode decomposition by graph denoising and boundary treatment,” under review at *Computational Statistics*. [\[code\]](#)

[11] Shin, H.-Y., **Kim, K.**^{*}, Lee, K. and Oh, H.-S. (2025+). “Absolute average and median treatment effects as causal estimands on metric spaces,” under review at *Journal of Multivariate Analysis*. [\[arXiv\]](#) [\[code\]](#)

*: corresponding author(s), †: equal contributions

Grants and Funding

New Faculty Research Support (Soongsil University Research Fund)

Soongsil University

Soongsil University

Nov. 2025 - Oct. 2026

- Research Project Title: Statistical analysis of multivariate graph-valued data
- Role: Principal Investigator (PI)

Autonomous Core Research Institute Program (Basic Science Research Program)

National Research Foundation of Korea (NRF) grant funded by the Ministry of Education

NRF

Sep. 2025 - Feb. 2026

- Research Project Title: Factor modeling for multivariate graph-valued data
- Role: Co-Investigator (Co-I)
- Integrative Institute of Basic Sciences (IIBS), Soongsil University

Research Subsidies for Ph.D. Candidates (Basic Science Research Program)

National Research Foundation of Korea (NRF) grant funded by the Ministry of Education

NRF

Sep. 2024 - Aug. 2025

- Research Project Title: Spectral analysis of graph-valued data
- Role: Principal Investigator (PI)

Awards and Honors

Scholarship for Next Generation Scholars in Fundamental Science

Seoul National University

Seoul National University

Mar. 2021 - Feb. 2022,

Mar. 2024 - Aug. 2025

4th Prize in Extreme Value Analysis 2025 Data Competition

Extreme Value Analysis 2025

Extreme Value Analysis

Jun. 2025

- Team name: SHSmultiscale
- Task: Prediction of extreme precipitation from a large ensemble of climate model runs

2024 KISS Outstanding Student Paper Awards

Korean International Statistical Society (KISS)

KISS

Jan. 2025

IMS 2024 ICSDS Student Travel Awards

2024 IMS International Conference on Statistics and Data Science (ICSDS)

IMS ICSDS

Dec. 2024

Best Student Oral Presentation Award (1st Prize)

Korean Statistical Society Conference 2024 Winter

Korean Statistical Society

Nov. 2024

Best Student Oral Presentation Award (3rd Prize)

Korean Statistical Society Conference 2024 Summer

Korean Statistical Society

Jul. 2024

Outstanding Research Talent Fellowship

BK21 FOUR (Brain Korea 21 Program for Leading Universities & Students)

Seoul National University

Mar. 2022 - Aug. 2023

Best Student Oral Presentation Award (4th Prize)

Korean Statistical Society Conference 2023 Summer

Korean Statistical Society

Jul. 2023

2nd Prize in Extreme Value Analysis 2023 Data Competition

Extreme Value Analysis 2023

Extreme Value Analysis

Jun. 2023

- Team name: SHSmultiscale
- Task: Prediction of extremal quantiles and joint probabilities of exceedance events

Best Student Oral Presentation Award (4th Prize)

Korean Statistical Society Conference 2022 Summer

Korean Statistical Society

Jul. 2022

Excellent Teaching Assistant Award

Faculty of Liberal Education

- Course Title: The World of Uncertainty and Statistics

Scholarship for Graduate Student Instructor

College of Natural Sciences

The National Scholarship for Science and Engineering

Korea Student Aid Foundation

- All semesters during the undergraduate period

Top 30 teams in NAVER AI Vision Hackathon 2018

NAVER Corp.

- Image retrieval challenge using a large dataset

Army Chief of Staff Award

Ministry of Defense Start-up Challenge 2018

- Developed a diary app for self-management by researching state-of-the-art NLP techniques including Deep Learning
- Advanced to K-Startup Challenge 2018

Dean's list

College of Natural Sciences

- 2014 1st semester, 2014 2nd semester, 2015 1st semester, 2016 2nd semester, 2017 1st semester

Bronze medal in Collegiate Mathematics Competition

Korean Mathematical Society

Silver medal in Korean Mathematics Olympiad

Korean Mathematical Society

- Placed within the top 50 candidates for the International Mathematical Olympiad

Seoul National University

Feb. 2022

Seoul National University

Sep. 2020 - Feb. 2021

Seoul National University

Mar. 2014 - Aug. 2017,

Sep. 2019 - Feb. 2020

NAVER CONNECT ONE

Dec. 2018 - Feb. 2019

KT&G Sangsangmadang

Chuncheon

Jun. 2018 - Sep. 2018

Seoul National University

Jun. 2014 - Dec. 2017

Seoul National University

Nov. 2014

Seoul National University

Aug. 2012

Talks and Presentations

Korean Data & Information Science Society Conference 2025 Fall

Title: Principal component analysis in the graph frequency domain (Oral Session)

Daegu, Korea

Oct. 2025

Joint Statistical Meeting 2025

Title: Principal component analysis in the graph frequency domain (Oral Session / KISS Outstanding Student Paper Award)

Nashville, Tennessee

Aug. 2025

2024 IMS International Conference on Statistics and Data Science (ICSDS)

Title: Cross-spectral analysis of bivariate graph signals (Oral Session / Student Travel Award)

Nice, France

Dec. 2024

Korean Statistical Society Conference 2024 Winter

Title: Principal component analysis in the graph frequency domain (Oral Session)

Daejeon, Korea

Nov. 2024

Korean Statistical Society Conference 2024 Summer

Title: Quantile-based fitting for graph signals (Oral Session)

Seoul, Korea

Jul. 2024

Graph Signal Processing Workshop 2024

Title: Quantile-based fitting for graph signals (Oral Session)

Delft, The Netherlands

Jun. 2024

Joint Statistical Meeting 2023

Title: Network time series forecasting using spectral graph wavelet transform (Oral Session)

Toronto, Canada

Aug. 2023

Korean Statistical Society Conference 2023 Summer

Title: Absolute average and median treatment effects as causal estimands on metric spaces (Oral Session)

Busan, Korea

Jun. 2023

Data Science, Statistics & Visualisation 2022 Conference

Title: Principal component analysis for river network data: Use of spatio-temporal correlation and heterogeneous covariance structure (Oral Session)

Tainan, Taiwan, ROC (Hybrid)

Jun. 2022

Korean Statistical Society Conference 2022 Summer

Title: Principal component analysis for river network data: Use of spatio-temporal correlation and heterogeneous covariance structure (Oral Session)

Seoul, Korea

Jun. 2022

Teaching Experience

Teaching

Soongsil University

Multivariate Analysis (2150346901)

Fall 2025

Quality Control (2150212501)

Fall 2025

Teaching Assistant

Seoul National University

Statistical Consulting and Practices (326.517A)

Spring 2022, Fall 2022, Spring 2025

The World of Uncertainty and Statistics (046.003)

Fall 2024

Theories of Statistics 1 (326.519A)

Spring 2024

Probability Concept and Applications (326.211)

Spring 2023

The World of Uncertainty and Statistics (046.003)

Fall 2021

Probability Concept and Applications (326.211)

Spring 2021

Statistical Computing and Lab. (326.212)

Fall 2020

Lab Instructor

Statistical Research Inst., SNU

Public lecture (Exploratory Data Analysis / Regression Analysis / Analysis of Variance)

Aug. 2022, Aug. 2024

Public lecture (Regression Analysis / Analysis of Variance)

Feb. 2023, Feb. 2024

Special lecture (Statistical Prediction)

Feb. 2022

Technical Skills

Programming

R, Python, SAS, C, JAVA

Machine Learning Frameworks

Tensorflow, Keras, PyTorch

Typesetting

LaTeX, Beamer

Languages

Korean (Native), English (Intermediate)