Minji Kim

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Education

Ph.D. in Statistics and Operations Research, University of North Carolina at Chapel Hill (UNC) — Chapel Hill, NC
- Advisor: Dr. Vladas Pipiras — Aug 2021 – May 2026

M.S. in Statistics, Seoul National University (SNU) — Seoul, South Korea
- Advisor: Dr. Hee-Seok Oh — Mar 2019 – Feb 2021

B.S. in Statistics, Minored in Computer Science and Engineering, Seoul National University (SNU) — Mar 2015 – Feb 2019

Work Experience

Google | Software Engineer Intern | Google Research — San Francisco, CA
- Designed and implemented a factuality evaluation metric for Gemini outputs, using **Python/Colab**. — May 2025 – Aug 2025
- Collaborated with Google Research scientists to validate the metric against human raters and existing approaches.

Moloco | Software Engineer Research Intern — Seattle, WA
- Designed and conducted experiments with exploration strategies for digital ads bidding models. — May 2023 – Aug 2023
- Identified a critical data distribution shift and proposed and developed a reweighting strategy (arXiv) using **SQL** and **Python**.

Lawrence Livermore National Laboratory (LLNL) | NSF Mathematical Sciences Graduate Intern — Livermore, CA
- Developed data-driven methods in *libROM*, a scalable **C++** library, to accelerate physics simulation. — May 2022 – Jul 2022

Research Experience

Focus: Statistical and ML methods for physical simulations (e.g., climate, naval) and spatio-temporal / time-series analysis.

Multi-fidelity modeling (UNC) [2,3,5,6]
- Developed statistical methods to combine multi-fidelity simulation codes (varying in accuracy and cost) for efficient estimation of distribution of limited high-fidelity outputs in **R**. Approaches: importance sampling, multi-fidelity Monte Carlo

AI for Science: solving spatio-temporal PDEs (UNC) [4]
- Applied physics-informed neural networks (PINNs) with latent space FourierNet to approximate PDE solutions in **PyTorch**.

Spatio-temporal (ST) analysis of Particular Matter data (SNU)
- Projected ST data into a latent space for quantile analysis, forecasting, and missing data prediction using EM algorithm.

Multi-scale time-series clustering (SNU) [7] applied to large-scale step count data from wearable devices and COVID-19 data.

Course Projects (UNC) Generative diffusion models / **Undergraduate Research Intern (SNU)** MRI Stroke Lesion Segmentation

Teaching Experience

Instructor [UNC] STOR 155, Introduction to Data Models and Inference (24F)

Teaching Assistant [UNC] Statistical Theory (25F), Introduction to Deep Learning (22Sp), Methods of Data Analysis (22Sp, 21F), [SNU] Sampling Design and Survey (20F), Design and Analysis of Experiments (20Sp), Statistics Lab (20Sp, 19F)

Selected Honors and Awards

- **Cambanis-Hoeffding-Nicholson Award (2022)** UNC, for outstanding academic performance in first-year doctoral program.
- **NSF Mathematical Sciences Graduate Internship (2022)** Oak Ridge Institute for Science and Education.
- **Korean Government Scholarship for Overseas Study (2021, $80K)** Korean Government, 5 students in the Intelligent Infrastructure field selected nationwide for a doctoral study abroad program.
- **The Presidential Science Scholarship (2015, Tuitions and incentives)** Top national scholarship for outstanding STEM students.

Publications

[1] A. Larsson et al., 'Survey on quadrature point selection in hyper-reduced order models for finite element methods', Preprint.

[2] **M. Kim**, B. Brown, V. Pipiras, (2025), 'Parametric multi-fidelity Monte Carlo estimation with applications to extremes', submitted.

[3] **M. Kim**, K. O'Connor, V. Pipiras, T. Sapsis, (2025), 'Sampling low-fidelity outputs for estimation of high-fidelity density and its tails', *SIAM/ASA Journal on Uncertainty Quantification*.

[4] **M. Kim**, T. Wen, K. Lee, Y. Choi, (2024), 'Physics-informed reduced order model with conditional neural fields', *NeurIPS 2024 Workshop on Machine Learning and the Physical Sciences*.

[5] **M. Kim**, V. Pipiras, T. Sapsis. (2024), 'Statistical Reduced-Order Modeling of Peaks of Vertical Bending Moment in Irregular Waves', *Proceedings of the 35th Symposium on Naval Hydrodynamics (SNH)*, Nates, France.

[6] **M. Kim**, V. Pipiras, A. Reed, K. Weems, (2023), 'Calibration of low-fidelity ship motion programs through regressions of high-fidelity forces', *Ocean Engineering* **290**, 116321.

[7] **M. Kim**, H. Oh, and Y. Lim, (2023), 'Zero-Inflated Time-Series Clustering Via Ensemble Thick-Pen Transform', *Journal of Classification* **40**, 407–431.

Technical Skills

Languages: Python, R, C++, Julia, SQL **ML/AI:** PyTorch, JAX, TensorFlow **Tools:** Git, Bash, slurm, CUDA, dplyr, NumPy, ggplot2