

JAEHOAN KIM

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Department of Statistical Science, Duke University, Durham, NC 27708

<https://jaehoankim.github.io>

EDUCATION

Duke University Durham, NC

Aug. 2023 – Present

Ph.D. Student, Statistical Science

- Transferred after a year in Texas A&M University
- Ranked first place in all the exams taken at Texas A&M University

Texas A&M University College station, TX

Aug. 2022 – May 2023

Ph.D. Student, Statistics

- *GPA: 4.00/4.00*

Seoul National University Seoul, Korea

Mar. 2016 – Aug. 2022

B.S., Statistics and Mechanical Engineering (Double major, Summa Cum Laude)

** 2-year leave of absence for military service*

- *Thesis title: Fluid dynamic analysis of ping-pong ball trajectory* [Codes]
- *Statistics Major GPA: 4.18/4.3*

Gyeonggi Science High School Suwon, Korea

Mar. 2013 – Feb. 2016

Math and science specialized high School, 1 year early entrance

PUBLICATIONS

1. **Jaehoan Kim**, Jaeyong Lee, (2021) Identifiability of Covariance Kernels in the Gaussian Process Regression Model. *Journal of the Korean data & information Science Society*, 32(6), 1373–1392. [Arxiv]
2. **Jaehoan Kim**, Hoyoung Park, Junyong Park, (2023) High dimensional discriminant rules with shrinkage estimators of covariance matrix and mean vector. Submitted to *J. Stat. Planning and Inference*. [Arxiv]

MANUSCRIPT UNDER PREPARATION

3. **Jaehoan Kim**, Debdeep Pati, (2023+) Adaptive finite element type decomposition of Gaussian random fields.

RESEARCH EXPERIENCE

High dimensional multiple testing Laboratory, *Seoul National University*

Jun. 2021 – Nov. 2022

Undergraduate researcher (Advisor: Prof. Junyong Park)

- Proved the asymptotic property of linear discriminant rules based on the shrinkage mean estimator using f -modeling strategy
- Compared the performance of linear discriminant rules built upon multiple precision estimation strategies in high dimensional situation

Bayesian Statistics Research Laboratory, *Seoul National University*

Aug. 2020 – Jun. 2021

Undergraduate researcher (Advisor: Prof. Jaeyong Lee)

- Suggested the sufficient condition for identifiability in a Gaussian process with a mixed covariance kernel
- Designed an experiment to analyze the thermal conductivity of metals in the Bayesian aspect

WORK EXPERIENCE

- Graduate Research Assistant**, *advisor: Prof. Debdeep Pati* Jan.2023 – May.2023
- Constructed computationally efficient algorithms for approximate Gaussian process (GP) sampling
 - Justified the required number of basis functions when approximating the GP using the finite element method, achieving the minimax-optimal posterior convergence rate
- Intellicon Lab, Inc.**, Seoul, Korea Feb. 2022 – Apr. 2022
- Research intern in a project to build an art education application*
- Suggested image similarity metrics using the values in a latent space of a Convolutional Autoencoder
 - Constructed a python code converting the given color image into a sketched version without OpenCV using Convolutional Autoencoder structure with 3000+ color-sketch image pairs for training
- KBrainLab LLC.**, Yongin, Korea Jun. 2021 – Jun. 2022
- Startup which provides Korean lottery number recommendation service*
- Developed a lottery number recommendation algorithm using graph theory that improved the expected value of the customers by 9%, ensuring 100% of winning the high-rank lottery in a group aspect
 - Substantiated the effectiveness of the algorithm with nonparametric testing methods
 - Took the initiative of founding as a Chief Technical Officer / Co-founder
- 20th Fighter Wing**, *Republic of Korea Air Force* Feb. 2018 – Jan. 2020
- Served and honorably discharged from Republic of Korea Air Force, Staff Sergeant

AWARDS

- SECTASA (Southeast Texas Chapter of American Statistical Association) Poster Session**
- Honorable mention, 2023
- University Mathematics Competition**, *Korean Mathematical Society*
- **1st place Nationwide**, grand prize, 2020 (Awarded \$1,000)
 - **2nd place Nationwide**, gold prize, 2019
- Korean Mathematics Competition**, *Korean Society of Mathematical Education*
- **1st place**, grand prize, 2015

HONORS

- KSEA-KUSCO graduate scholarship** Aug. 2023
- Given to 20 Korean graduate students recognized for excellent academic performance (USD 2,000 \$)
 - The only recipient in the Department of Statistics
- Overseas Ph.D. Scholarship**, *Yongwoon Scholarship Foundation* Aug. 2022
- Merit-based scholarship for promising Ph.D. students studying out of Korea (USD 25,000 \$)
 - Selected as one of four recipients nationwide in 2022
- Young Engineer's Honor Society** Sep. 2020 – Present
- National Academy of Engineering of Korea
- SNU Engineering Honor Society (STEM)** Sep. 2020 – Present
- College of Engineering, SNU
- Merit-Based Scholarship**, *Hyunsong Educational & Cultural Foundation* Feb. 2017 – Dec. 2021
- Merit-based scholarship for undergraduate student (USD 6,000 \$ per year)
 - Nominated as the representative of the Department of Engineering

COURSEWORK

Graduate Courses

- **Theory of Statistics (A+, Class Rank: 2/35)**, Seoul National University
- **Probability Theory (STAT 614), Statistical Computations (STAT 600), [R package], Theory of Linear Models (STAT 612), Statistical Methodology I, II (STAT 620, 632)**, Texas A&M University
- **Multivariate Statistics (STA832), Information theory (STA587)**, Duke University

TEACHING EXPERIENCES

- STA432**, Duke University Fall' 2023
- Worked as a graduate assistant in teaching
- STAT630**, Texas A&M University Fall' 2022
- Worked as a graduate assistant in teaching (graduate course)
 - Hosted weekly TA sessions and graded 10+ homework of 40+ students
- Regression Analysis and Lab.**, Seoul National University Spring' 2022
- Selected as an undergraduate tutor and hosted 10+ tutoring sessions in Regression Analysis and Lab., a requisite course for juniors in Statistics
- Mathematical Statistics 2**, Seoul National University Fall' 2021
- Selected as an undergraduate tutor and hosted 10+ tutoring sessions in Mathematical Statistics 2, a requisite course for juniors in Statistics
- Dynamics and Fluid Mechanics**, Seoul National University Sep. 2020 – Feb. 2021
- Selected as an undergraduate tutor and hosted 10+ tutoring sessions in Dynamics and Fluid Mechanics, a requisite course for juniors in Mechanical Engineering
- Calculus 1**, Seoul National University Winter' 2020, Winter' 2021
- Assisted 10 freshmen with 5+ assignments and feedback about calculus 1 course

EXTRACURRICULAR ACTIVITIES

- AI Tech Play** Jan. 2021 – Aug. 2021
- Led the Technology Team to deliver free AI education to 200+ middle school students struck by COVID-19
 - Created a coding education booklet based on the autonomous RACECAR code materials from MIT Lincoln Lab.
- Campus Mentoring Program**, Seoul National University Aug. 2020 – Dec. 2020
- Assisted the adaptation of 15 freshmen to university life as a mentor group leader
- SNU Buddy** Spring 2020, Spring 2021, Fall 2021
- Official buddy program for the international exchange students in Seoul National University
- Global Inter-culturing and Volunteering**, Seoul National University Mar. 2016 – Feb. 2018
- Organized the volunteering education camp for equal opportunity of education for students in underprivileged areas as a vice president
 - Performed community service in Cambodia for two weeks; educated elementary school students with self-planned material, built a community garden and provided free rice to people (*Summer' 2016*)
 - Educated math for elementary school students with a self-devised curriculum in underprivileged areas for a week as a team leader (*Summer' 2017, Winter' 2017, 2018*)
- X-corps (Practical Issue Research Contest)** Jul. 2017 – Jan. 2018
- Established a drone-based automated survivor detection system in a fire scene using a path-planning algorithm
 - Devised a signal detection algorithm using the variance after a fast Fourier transform and improved the filtration accuracy significantly
- Dream Camp Mentoring** Jul. 2017
- Designed the mentoring program and educated high school students in the countryside

SKILLS

- **Programming:** R, Python, MATLAB, C++
- **English:** iBT: 109 (R30, L30, S22, W27), GRE: Verbal 157, Writing 4.0
- **GRE Subject Test:** Mathematics (Scaled score: 970, Percentile: 97%)