Jaewon Kim

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EDUCATION

Korea University   **2022.03 – Present**
B.E. Semiconductor Engineering   *Seoul, Korea*
- **GPA**: 4.35/4.5 (3.93/4.0)
- SK Hynix-KU Partnership Fellowship (Full tuition + monthly stipend)
- Mandatory military service as Social Service Agent (2025–2026)

RESEARCH INTEREST

- Generative Models
- Stochastic Partial Differential Equations
- Deep Reinforcement Learning
- Physics-Informed Machine Learning

RESEARCH EXPERIENCE

Complex Data Analysis Lab (CDAL)   **2024.02 – Present**
Undergraduate Researcher (Advisor: Prof. Seok Junhee)   *Seoul, Korea*

- **High-Dimensional Conditional Generation.** Extended continuous conditional diffusion models from scalar to multi-dimensional regression labels using Hutchinson-based random projections and prioritized sampling, achieving state-of-the-art performance on nanophotonic device inverse design.

- **Reinforcement Learning for Super Resolution.** Developed a novel RL-based approach for image super resolution that overcomes diffusion model limitations by formulating the task as a Markov decision process, enabling flexible optimization of multiple quality metrics (PSNR, SSIM, LPIPS) through reward design.

- **Physics-Informed Policy Learning.** Proposed Fokker-Planck Soft Actor-Critic (FP-SAC) that reformulates policy improvement as solving partial differential equations, enabling capture of multi-modal distributions beyond traditional Gaussian-constrained approaches.

PUBLICATIONS

Journals

- Kim, J.[1], Hwang, H. S.[1], & Seok, J. (2025). Scalable Continuous Conditional Diffusion via Random Projections and Prioritized Sampling. *Under Review*

Conferences

- Hwang, H. S.[1], Kim, J., & Seok, J. (2025). Fokker-Planck Soft Actor-Critic. *Under Review*

HONORS & AWARDS

SK Hynix-KU Partnership Fellowship (4-year full tuition + monthly stipend)	2022.02 – Present
KU Alumni Scholarship, Korea University	2022.02 – Present
Semester High Honors, Korea University	2022.03 – Present
2024 Outstanding Poster Award, 12th SK Hynix Academic Conference	
2022 1st Semester Dean's List, Korea University	

EXTRACURRICULAR ACTIVITIES

Young Engineers' Honor Society (YEHS)   2024.03 – Present
- Honor Society sponsored by the National Academy of Engineering of Korea (NAEK).

BITAmin   2023.08 – 2024.08
- Intercollegiate offline study group focusing on ML/DL research and projects

Korea University International Student Assistant (KUISA)   2023.02 – 2024.02
- Voluntary student organization under Global Services Center, Korea University.

SKILLS & INTERESTS

Language Skills: Korean(Native), English(Fluent)
Computer Skills: Python (Pytorch, Tensorflow), Matlab, C, C++
Interests: Music, Basektball, Badminton, Cooking, Traveling, Math

SELECTED COURSEWORKS

Statistics & Mathematics: Engineering Mathematics I, Engineering Mathematics II, Probability and Random Process, Introduction to Linear Algebra, Fundamentals of Data Science, Data Learning and Intelligence

Electrical and Computer Engineering: Introduction to Computers, Object-Oriented Programming, Microprocessor, Computer System, System Software, Signal and Systems, Digital Image Processing, Digital Signal Processing, Deep Signal Processing