

Suhyun Bae

baeshstar@gmail.com | +82-10-3357-4231 | linkedin.com/in/suhyun-bae-869043286

github.com/Ricepunchb

Education

Korea University

Mar. 2024 – Feb. 2026

- Master of Science in Mathematical Data Science, GPA 4.19/4.5
- **Advisor:** Prof. Donghun Lee, **Master Capstone Project:** “Numbers Already Carry Their Own Embeddings”
- **Relevant Coursework:** Mathematics of Deep Learning, Mathematics of Reinforcement Learning, Mathematics of Artificial Intelligence, Applied Mathematics

Korea University

Mar. 2018 – Feb. 2024

- Bachelor of Science in Mathematics, GPA 3.5/4.5
- **Relevant Coursework:** Linear Algebra, Mathematical Methods in Artificial Intelligence, Calculus, Applied Number Theory, Real Analysis, Algebra, Topology, Set Theory

Research Interests

- Algebraic Representation Learning
- Hallucination Mitigation Detection
- Trustworthy Reliable AI

Experience

Artificial Intelligence and Mathematical Learning Lab (AIML@K), Korea

Apr 2026 – Present

University, Room 640, Asan Science Building, 145 Anam-ro, Seongbuk-gu, Seoul, South Korea

- Research Associate
- Spearheaded R&D on novel numerical embedding methodologies that fundamentally enhance the mathematical reasoning and logical deduction capabilities of LLMs by converging algebraic structures and harmonic analysis.
- Developed production-ready, plug-and-play numerical embedding modules designed for immediate integration into arbitrary pre-trained LLMs.
- Co-authored research papers successfully accepted for publication at top-tier venues including NeurIPS 2025 Workshop (MATHAI) and ICML 2026 Workshop (AI4MATH).

SK Magic, Seoul, South Korea

Jul. 2024 – Jan. 2025

Data Scientist (Intern)

- Served as an initial member of the Autonomous Air Purifier TF, formulating a mathematical optimization algorithm for the spatial placement of auxiliary sensors
- Designed a custom risk index and implemented spatial interpolation techniques to predict and construct high-fidelity environmental maps using sparse sensor data
- Defined navigation criteria and operational scenarios for autonomous air purification to ensure optimal coverage and efficiency in dynamic indoor environments

Publications

Published

Exploring Hallucination Types in Question-Answering Generation and Limitation of Text Evaluation Metrics

Jun. 2024

Suhyun Bae, Donghun Lee

Proceedings of the Korea Information Science Society Conference, pp. 450–452.

Accepted

Prime Fourier Embeddings: A Principled Basis for Modular Arithmetic 2026.6

Hyunsang Hwang, *Suhyun Bae*, Donghun Lee

ICML 2026 Workshop AI4MATH

Numbers Already Carry Their Own Embeddings Oct. 2025

Suhyun Bae, Donghun Lee

NeurIPS 2025 Workshop MATH-AI

OPC: One-Point-Contraction Unlearning Toward Deep Feature Forgetting Jul. 2025

Jaeheun Jung, Bosung Jung, *Suhyun Bae*, Donghun Lee

ICCV 2025 Workshop U&ME

Projects

Adele Embeddings Project MATH and AI

- Designed a deterministic embedding space based on Adele space to preserve algebraic structure in number token embeddings
- Explored the structural efficiency of embeddings to improve LLM inference performance
- Tools: PyTorch, Python

2025 SCPC: AI Challenge Samsung Electronics

- Developed an on-device Vision-Language Model (VLM) capable of understanding everyday images and performing background knowledge-based reasoning
- Optimized on-device VLM inference using QLoRA and Flash Attention to overcome memory bandwidth limitations in edge environments
- Achieved top 9% (23rd place) and advanced to finals
- Tools: PyTorch, Hugging Face, Python

2023 AI Grand Challenge Ministry of Science and ICT,
South Korea

- Engineered robust data pipelines and fine-tuned models to optimize performance on multi-answer datasets
- Team award: 7th place
- Tools: OpenAI API, Python, RegEx

Technical Skills

Programming Languages: Python, \LaTeX

Frameworks & Libraries: PyTorch, Hugging Face, pandas, NumPy

Tools: Linux, Git, Docker

Language

English

- OPIc: IH (Intermediate High)

Korean

- Native