

Minseong Bae

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Education

KAIST

Sep 2025 – Present

M.S. in Computer Science

- Cumulative GPA: 4.30/4.30 (100/100)

Korea University

Mar 2021 – Aug 2025

B.E. in Computer Science & Engineering

B.S. in Mathematics (Double Major)

- Cumulative GPA: 4.37/4.50 (98.7/100, 148/130 credits)
- Graduated with **Great Honor**

Busan Science High School

Mar 2018 – Feb 2021

High School Diploma

Research Interests

My research interests lie in **generative modeling** across diverse modalities and **geometric deep learning**, particularly in their applications to the natural sciences for tackling impactful real-world problems (**AI4Science**). Recently, I have been particularly interested in generative model-based world modeling, reward-guided generation, and agentic systems for scientific modeling and discovery. Through these directions, I aim to develop methods that integrate reasoning, generative modeling, and representation learning to model, simulate, and optimize complex scientific phenomena.

My long-term research goal is to build robust and scalable learning frameworks that support the scientific research loop and enable self-improving, human-collaborative agents for scientific discovery.

Experiences

Research Assistant

Daejeon, South Korea

MLV Lab, KAIST

Feb 2025 – Present

- **Advisor:** Prof. Hyunwoo J. Kim
- Researching foundation and generative models across diverse domains, including multimodal scientific data.

Undergraduate Student Researcher

Seoul, South Korea

MLV Lab, Korea University

Jul 2022 – Jan 2025

- **Advisor:** Prof. Hyunwoo J. Kim
- Explored various research topics, including machine learning on graphs, diffusion models, and multimodal large language models during a research internship. (2022-2023)
- Researched large molecule-language models [C1-2] and AI-based weather forecasting [U1]. (2024-2025)

Publications

2026

[C4] **F⁴Splat: Feed-Forward Predictive Densification for Feed-Forward 3D Gaussian Splatting**

Injae Kim, Chaehyeon Kim, **Minseong Bae**, Minseok Joo, Hyunwoo J. Kim

The 19th European Conference on Computer Vision (ECCV 2026)

[C3] **TabFlash: Efficient Table Understanding with Progressive Question Conditioning and Token Focusing**

Jongha Kim, **Minseong Bae**, Sanghyeok Lee, Jinsung Yoon, Hyunwoo J. Kim

The 40th Annual AAAI Conference on Artificial Intelligence (AAAI 2026)

[C2] **Improving Large Molecular Language Model via Relation-aware Multimodal Collaboration**

Jinyoung Park, **Minseong Bae**, Jeehye Na, Hyunwoo J. Kim
The 40th Annual AAAI Conference on Artificial Intelligence (AAAI 2026)

2024

[C1] LLaMo: Large Language Model-based Molecular Graph Assistant

Jinyoung Park, **Minseong Bae**, Dohwan Ko, Hyunwoo J. Kim
Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS 2024)

Under Review

[U2] PROLA: Principal-Orthogonal Low-rank Adaptation for Predictive Spatiotemporal Weather Downscaling

Minseo Yoon, **Minseong Bae**, Sojin Lee, Hyunwoo J. Kim

[U1] G-WIND: Graph-Based Probabilistic Weather Forecasting with Latent Diffusion

Minseo Yoon, Jinyoung Park, Seunghoon Lee, **Minseong Bae**, Jaewon Chu, Hyunwoo J. Kim

Projects

AI-Based Specialized Foundation Model Development Project

Nov 2025 - Present

- Funded by the Ministry of Science and ICT of Korea.
- Participating in the Lunit Consortium, developing a multi-scale foundation model specialized in medical science for end-to-end innovation from molecules to populations.
- Collaborating with SK Biopharmaceuticals on the development of benchmarks for agentic AI systems for biochemical research.

CLIMECAST: Climate Event Prediction Using AI & Science Technology

Jun 2024 - Present

- Funded by Advanced Science & Technology Research Agency (ASTRA) Center of the National Research Foundation (NRF) of Korea.
- Explored ERA5 data processing and compression methods, and reimplemented/trained weather foundation models such as ClimaX and Stormer. Participated in the development of a latent diffusion-based weather forecasting model [U1]. (2024)
- Researching scaling law and parameter-efficient fine-tuning approaches for weather foundation models and leading precipitation nowcasting model development. (2025 - Present)

Awards & Scholarships

Honorable Mention, The 4th NIMS Weather-AI Boostcamp

2025

- Participated as a team leader in a hackathon program held in conjunction with the WMO (World Meteorological Organization) AINPP (Artificial Intelligence for Nowcasting Pilot Project) Workshop
- Topic: Toward Effective and Realistic Satellite Video Prediction for Precipitation Nowcasting

Seoul Hope University Career Scholarship

2024

- Merit-based scholarship (\$2700) from Seoul Scholarship Foundation

National Scholarship for Science and Engineering

2023 - 2025

- Merit-based scholarship from Korea Student Aid Foundation
- Full tuition support for 4 semesters

Semester High Honors, Korea University

Spring 2021 - Spring 2025

- for 8 semesters

President's Award, Korea University

Fall 2021 - Fall 2022

- for 3 semesters
- Academic excellence award given to a student with GPA 4.5/4.5 for two consecutive semesters

Dean's Award, Korea University

Spring 2021

- Academic excellence award given to a student with GPA 4.5/4.5 for a semester

Skills

Programming Languages: Python (Advanced); C/C++ (Intermediate); OCaml, R, MATLAB (Experienced)

Libraries & Frameworks: PyTorch, PyTorch Geometric, Huggingface Transformers

Languages: Native in Korean, Conversational in English (TOEIC 960)

Professional Services

Event Organizations

- Student Organizer at [KAIST @ ICML 2026](#)

Teaching Experience

Teaching Assistant

- KAIST CS.40700 Introduction to Artificial Intelligence, Spring 2026

Extracurricular Activities

Taskforce for 2023 & 2024 InThon, Korea University

2023 - 2024

- Taskforce and competition question developer for the datathon track of InThon at the College of Informatics
- Topic in 2023: Korean Natural Language Generation (also served as taskforce leader)
- Topic in 2024: Reliable & Efficient Image Captioning with Vision-Language Models

Co-founder of [AIKU](#); AI in Korea University

2022 - 2023

- Co-founder of AI academic club for undergraduate students at Korea University
- Served as administrator and project leader

President of Korea University Computer Science Academy

2021 - 2024

- Academic club for students at the College of Informatics, studying computer science
- Worked as an instructor for various studies (Linear Algebra, Probability and Statistics, Data Structures, Artificial Intelligence, Machine Learning & Deep Learning)

Completed Yonsei Univ.-Naver Cloud Data Science Education Course

2021

Selected Courseworks

* indicates graduate-level courses.

Computer Science & Artificial Intelligence

Databases, Theory of Computation, Programming Language, Computer Architecture, Machine Learning, Deep Learning, Introduction to Computer Vision & Its Application, Advanced Machine Learning (Generative Models), Reinforcement Learning*, Bayesian Machine Learning*, Protein & Artificial Intelligence, Resource Efficient AI Research*

Mathematics & Statistics

Analysis I/II, Complex Analysis I, Real Analysis, Topology I, Linear Algebra I/II, Algebra I, (Ordinary) Differential Equations, Differential Geometry I, Introduction to Convex Optimization, Probability & Statistics, Mathematical Statistics, Introduction to Bayesian Statistics