Bosung Jung

Department of Mathematics
Mathematical Data Science
Korea University, Seoul Campus

2018160026@korea.ac.kr
010-6342-9935

EDUCATION

M.S. Korea University Graduate School, Department of Mathematics, Mathematical Data Science, Expected 2026
Overall GPA: 4.0/4.5

B.S. Korea University, College of Science, Department of Mathematics, 2024
Major GPA: 3.98/4.5
Overall GPA: 3.74/4.5

SCOLARSHIP

2016 ∼ 2019	BITCOMPUTER, Cho Hyun-jung Foundation's 18th scholarship student
2019	Korea University, Seokrim Association Scholarship
2022	Korea University, Academic Excellence Scholarship
2023	Korea University, Danglim Association Scholarship

RESEARCH AREAS

Machine Unlearning on Classification and Generation Model

Bayesian Optimization in Various Situations(Multi-Objective, Mixed-Space, Constraint)

Natural Language Processing with AI(Text, Dialogue, Raman Spectrum, Spectrogram)

Improving Small Language Model for Solving Mathematical Problems.

Analyzing optimizers through fractional derivatives and applying fractional derivatives in Gradient Descent.

WORK EXPERIENCE

September 2024 – December 2024: Nara-Information Co., Ltd.

Fine-tuned Small Language Models (SLMs), including LLaMA 3.2, Polyglot-ko, and Gemma2. Utilized various Parameter-Efficient Fine-Tuning(PEFT) methods, such as Full Fine-Tuning, QLoRA, and Rank-Stabilized LoRA.

The training data consisted of Q&A datasets related to civil complaints, which were transformed into chat dialogue using OpenAI's Batch API for instruction tuning.

Fine-tuned SLM with RAG to enable In-Context Learning (ICL).

Contributed to deploying a chatbot service on the KEAD (Korea Employment Agency for the Disabled) website by providing fine-tuned LLMs. Additionally, Develop a database service for RAG integration.

Established a periodic web crawling pipeline using Scrapy, Selenium, and BeautifulSoup to construct and maintain databases for the website.

Built and presented an end-to-end GraphRAG pipeline utilizing LangChain, OpenAI API, and Upstage API for corporate analysis reports within the organization.

※ For more Information, This is a link of korean report of Internship program

https://drive.google.com/file/d/11O8SsnblWX7h9nwoRmHCH9Jl-roJTcFt/view?usp=sharing

PUBLICATIONS

Conference Articles

2025 Jaeheun Jung, Bosung Jung, Suhyun bae and Donghun Lee, "OPC: One-Point-Contraction Unlearning Toward Deep Feature Forgetting", In ICCV 2025 workshop - 2nd Workshop and Challenge on Unlearning and Model Editing (U&ME), 2025

2025 Jaeheun Jung, Jaehyuk Lee, Chang-Hae Jung, Hanyoung Kim, Bosung Jung, and Donghun Lee. (2024). "Broadband Ground Motion Synthesis by Diffusion Model with Minimal Condition."*Forty-second International Conference on Machine Learning*, 2025

2024 Bosung Jung, Donghun Lee, Doyoon Kim "Impossibility of Optimizing Time-Fractional Gradient Descent With a Convex Function As the Objective Function." *Korea Computer Congress 2024*, Poster.

Journal Articles

2023 Sungwon Park, Bosung Jung, and Hongjoong Kim, "Generating Synthetic Raman Spectra of DMMP and 2-CEES by Mathematical Transforms and Deep Generative Models" *Journal of the KIMST 2023, vol.26, no.6, pp. 422-430 (9 pages).*

RESEARCH EXPERIENCE

2025: Machine Unlearning Project in AI+Math Lab@K

Implement a novel unlearning algorithm, based on one-point-contraction (OPC) strategy theoretical uncertainty in feature representations.

Comprehensive empirical validation of the effectiveness of method, demonstrating that OPC-unlearned model forgets much deeper than 12 existing machine unlearning methods.

2025: Collaborative Project with KOLON

Develop diverse Bayesian Optimization loop with BoTorch

Implement Multi-Objective · Constraint · Mixed Space Bayesian Optimization algorithm

2024: Earthquake imputation Project in AI+Math Lab@K

Dataset: SCEDC(Southern California Earthquake Data Center), INSTANCE(The Italian seismic dataset for machine learning)

Implement Ground Motion Prediction Equation metrics for evaluation

2023: Collaborative Project with Korea Exchange (KRX)

Dataset: IRS contracts of KRX's members

Contributed to the development of a hedging algorithm for IRS products of defaulting members

Designed a grouping algorithm using dynamic programming to minimize the sum of absolute values of group $PV01$ values

2022: Collaborative Project with Agency for Defense Development (ADD)

Data: Ramam Spectrums of DMMP, CEES-2

Contributed to simulating Raman spectra data

Utilizing discrete Fourier transform and discrete wavelet transform, etc, simulate graphs 1 to 2700.

After visualizing and saving as image data simulated graphs, VAE and GAN were trained for additional simulation.

COMPETITION EXPERIENCE

2024: AIMO Kaggle competition project in AI+Math Lab@K

Apply DPR in prompt engineering to enhance LLM's mathematical problem-solving abilities in few-shot learning.

Build America Mathematics Olympiad datasets for Fine-Tuning, by Crawling the websites with the BeautifulSoup library. Finetune LLM by applying Quantization, DDP, and LoRA.

2024: DPG, MAFRA korea Dacon competition project in AI+Math Lab@K

Make an AutoML pipeline for time series forcasting with NeuralForecast

Achieved the top 18% grade in the first submission

2024: Hansoldeco Dacon competition project in AI+Math Lab@K

Augment laguage datasets for Fine-Tuning using the Backtranslation method in English and Japanese.

Finetune LLM by applying RAG.

Achieved the top 33% grade in the first submission

2024: SK Telecom A.(Adot) EarlyAdotter 2nd Cohort – Prompt Engineering Competition Completion

Developed a set of prompts utilizing various LLMs available in the A. service to enable:

- Department recommendation based on user symptoms using GPT
- Location-based hospital recommendations using Perplexity, aligned with the recommended department
- Public transportation route suggestions to hospitals using GPT-o1-mini

Designed quantitative evaluation metrics to validate each prompt, including:

- Categorization of recommended medical departments by symptoms
- Distance and department classification of hospitals near subway stations

CERTIFICATIONS

Professional Certifications

SQL Developer (SQLD) – Issued by Korea Data Agency (KDATA), 2023

Updated July 2025