Bosung Jung

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Mathematical Data Science
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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

SCHOLARSHIP

2016 ∼ 2019 BITCOMPUTER, Cho Hyun-jung Foundation's 18th scholarship student

RESEARCH AREAS

Machine Unlearning on Classification and Generative Model

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

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

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)*.

PATENTS

2025 Jaeheun Jung, Bosung Jung and Donghun Lee, 'Apparatus and method for neural network unlearning based on one-point contraction', KR10-2025-0092132, Patent pending.

2025 Jaeheun Jung, Bosung Jung, Suhyun Bae and Donghun Lee, 'Apparatus and method for recovering and evaluating machine unlearned neural networks', KR10-2025-0092136, Patent pending.

WORK EXPERIENCE

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

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.

Extension OPC to generative models, such as DDPMs and Stable Diffusion.

Development of selective unlearning of domains(objects/styles) while maintaining model utility on other domains.

On the UnlearnCanvas benchmark, OPC achieved overall state-of-the-art performance

2025: Collaborative Project with KOLON

Develop full Bayesian Optimization loop with BoTorch

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

Developement of a unified pipeline combining AutoML and Bayesian Optimization

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

2025: AI Champion @Ministry of Science and ICT (MSIT, Korea)

Selected among the top 100 teams out of 630 in the preliminary screening.

Participated as team **ShannonFade**.

Research theme: Machine Unlearning.

Investigating whether *deep forgetting* can be achieved in both classification and generative models.

2025: 2nd Place, Genμ Challenge(U&Me Workshop) @ICCV'25 in AI+Math Lab@K

Participated in the Challenge focusing on *concept unlearning* in generative models.

Modified Stable Diffusion v1.4 to successfully forget 20 concepts while preserving general generation quality.

Generated and packaged 1,000 evaluation images, tested with a fixed Llava model using simple, indirect, and adversarial prompts.

Achieved 91.8% test prompt pass rate.

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) *EarlyAdottor* 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

Language Certifications

TOEIC – 845, 2025

Updated October 2025