Dongyeop Lee

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ABOUT

I am a third-year Master's student (and a PhD student starting from spring 2026) in the Graduate School of Artificial Intelligence at POSTECH, under the supervision of Professor Namhoon Lee. I have received my B.Sc. in Electronic Engineering from KNU.

I study **large-scale optimization** for **(a) distributive training**, **(b) neural network sparsification** [C3,P1], and also opened to **(c) general deep learning** [C1,2]. My research focuses on uncovering **optimization** principles **for** minimal infrastructure assumptions **so** that one can use existing resources as they are **to** train extreme-scale machine learning systems.

	for supporting:	**so** that one can train:	**to** ultimately enable:
(1)	low-resource scenarios	without acquiring {more, any} GPUs	individuals — to build powerful, large-scale models
(2)	low-bandwidth and unreliable communication	without {building, expanding} expensive, high-bandwidth centralized systems	groups of {individuals, organizations} — to collaboratively train much larger models
(3)	heterogeneous computing environments	without specialized, standardized homogeneous setups	almost {any, every} hardware — to be gathered to accelerate any such workload

Keywords: Large-scale distributed optimization, Asynchronous pipeline parallel optimization, Efficient ML, NN Pruning, Sharpness minimization, Overparameterization, Implicit bias

EDUCATION

Pohang, S. Korea
Mar 2026 (Expected)

PhD in Artificial Intelligence
- Computational Optimization Lab, Pohang University of Science and Technology (POSTECH)
- Advisor: Namhoon Lee

Pohang, S. Korea
Mar 2023 - Present

M.S. in Artificial Intelligence
- Computational Optimization Lab, Pohang University of Science and Technology (POSTECH)
- Advisor: Namhoon Lee

Daegu, S. Korea
Mar 2017 - Feb 2023

B.Sc.E. in Electronics Engineering
- Kyungpook National University (KNU)

PUBLICATIONS (Google Scholar)

C: conference, W: workshop, DC: domestic conference, U: under review, P: preprint, *equal contributions

[U1] **(Tentative Title) Efficient Out-of-Distribution Detection Method** — *2026*
Seonghwan Park, Hyunji Jung, Dongyeop Lee, and Namhoon Lee
- Under review

[P1] **The Unseen Frontier: Pushing the Limits of LLM Sparsity with Surrogate-Free ADMM** — *2025*
Kwanhee Lee, Hyeondo Jang, Dongyeop Lee, and Namhoon Lee
- **Best Paper Award**, Joint Conference of Korean Artificial Intelligence Association, Nov 2025
- paper, Linkedin

[C3] **SAFE: Finding Sparse and Flat Minima to Improve Pruning** — *Vancouver, Canada 2025*
Dongyeop Lee, Kwanhee Lee, Jinseok Chung, and Namhoon Lee
- International Conference on Machine Learning (**ICML**) 2025
- **Spotlight Presentation (313/12,107=2.6%)**
- **Winner**, Qualcomm Innovation Fellowship Korea 2025
- paper, code, thread, Linkedin

[C2] **SASSHA: Sharpness-aware Adaptive Second-order Optimization with Stable Hessian Approximation** — *Vancouver, Canada 2025*
Dahun Shin*, Dongyeop Lee*, Jinseok Chung, and Namhoon Lee
- International Conference on Machine Learning (**ICML**) 2025
- Conference of Korean Artificial Intelligence Association, 2024
- paper, code, thread, Linkedin

[C1] **Critical Influence of Overparameterization on Sharpness-aware Minimization** — *Rio de Janeiro, Brazil 2025*
Sungbin Shin*, Dongyeop Lee*, Maksym Andriushchenko, and Namhoon Lee
- Conference on Uncertainty in Artificial Intelligence (**UAI**) 2025
- **Best Paper Award**, Joint Conference of Korean Artificial Intelligence Association, Dec 2023
- ICML Workshop on High-dimensional Learning Dynamics, 2023
- paper, code, thread

[DC3] **Image Synthesis using In-Context Learning** — *Gangwon, S. Korea 2023*
Seunghun Lee, Eunchan Lee, Dongyeop Lee, and Sangtae Ahn
- The Symposium of Brain and Artificial Intelligence, Feb 2023

[DC2] **Development of a Virtual Pet Nurturing HW/SW Platform for Hospitalized School-age Children** — *Jeju, S. Korea 2022*
Eunhye Hong, Dongsu Kim, Suhyun Kim, Mingyeong Son, Dongyeop Lee, Hyunwoo Lee, Seongah Jeong
- Proceedings of KIIT Conference, Dec 2022

[DC1] **STARGen: Story to Art Generation using Fine-tuned Stable Diffusion** — *Seoul, S. Korea 2022*
Seunghun Lee, Dongyeop Lee, Eunchan Lee, and Sangtae Ahn
- Joint Conference of Korean Artificial Intelligence Association, Nov 2022

EXPERIENCE

Seoul, S. Korea
Sep 2024 - Feb 2025

Student researcher | *Google*
- Examined the influence of calibration data on LLM pruning techniques.
- Explored strategies to enhance calibration data construction for improved results.
- Hosts: Kyuyeun Kim, Shivani Agrawal

Daegu, S. Korea
Feb 2022 - Dec 2022

Undergraduate researcher | *Brain AI Lab, KNU*
- Studied multi-modal vision-language modeling
- Explored automatic prompting of stylized text into form suitable for image generation [DC1,3].
- Advisor: Sangtae Ahn

Online
Jun 2022 - Oct 2022

Student research fellowship | *SKT AI Fellowship Program*
- Selected as 4th SKT AI Fellowship for topic on Language-Image Multi-modal AI Technology Research.
- Developing image synthesis model fine-tuned for illustration generation from chat-styled input text for active service deployment [DC1,3].
- Mentors: Jisung Kim, Hongin Kim, Hyeonjun Eun

S. Korea
Apr 2018 - Jan 2020

Naval Korean-English Interpreter (PO2) | *ROK Navy*
- Mandatory military service at the Navy (ROK 2nd Fleet and 96th Submarine Squadron) as an interpreter.

AWARDS & SCHOLARSHIPS

2025 **Winner,** Qualcomm Innovation Fellowship Korea 2025 — *Seoul, S. Korea*

2025 **Best Paper Award,** The 10th Joint Conference of Korean Artificial Intelligence Association 2025 — *Seoul, S. Korea*

2023 **Best Paper Award,** The 8th Joint Conference of Korean Artificial Intelligence Association 2023 — *Seongnam, S. Korea*

2017-22 **National Scholarship of Excellence (Sci. & Eng.),** The Ministry of Science and ICT and the Korea Student Aid Foundation

TALKS & EXHIBITIONS

2025 **Poster presenter | Samsung Artificial Intelligence Forum,** "SAFE: Finding Sparse and Flat Minima to Improve Pruning" — *Suwon, S. Korea*

2025 **Speaker | Artificial Intelligence Graduate Schools (AIGS) Symposium,** "SAFE: Finding Sparse and Flat Minima to Improve Pruning" — *Seoul, S. Korea*

TEACHING EXPERIENCE

2025 **Teaching Assistant,** "Programming & Problem solving" (CSED101, Python), POSTECH — *Pohang, S. Korea*

2023 **Teaching Assistant,** "Machine Learning and Deep Learning", POSCO AI Experts Training Program — *Pohang, S. Korea*

SERVICES

Reviewer for conferences: UAI

PATENTS

Pruning Method for Deep Learning, Hardware Apparatus for Deep Learning and Electronic Apparatus *Nov 27, 2025*
- Namhoon Lee, Kwanhee Lee, Hyeondo Jang, Dongyeop Lee | Applied for Korean Patent No.10-2025-0184323

Large Language Model Sparsification Method, Hardware Apparatus and Server *Nov 27, 2025*
- Namhoon Lee, Dongyeop Lee, Kwanhee Lee, Jinseok Chung | Applied for Korean Patent No.10-2025-0184411.

PROJECTS

STARGen: Story Art Generation for SKT A. service using fine-tuned stable diffusion | blog, code *2022*
- Designed story art generation pipeline targeted to be compatible with SKT's A. (A-Dot) model/service.
- Advanced fine-tuning/editing strategies were employed for stylized and controlled image generation and prompt optimization techniques to enhance output quality and consistency [DC1,3].

KiDuck: A virtual pet nurturing HW/SW platform for hospitalized school-age children | code *2022*
- Developed an Arduino-based handheld device to promote healthy habits (e.g., hydration, physical activity, social interaction) with Bluetooth, infrared, and Wi-Fi as a part of a capstone design project.
- Contribute to designing core software (GUI and logic) and hardware circuits for the device.

SOFTWARE

Malet: a tool for machine learning experiment | pip, code *2023 - 2025*
- Malet (Machine Learning Experiment Tool) is a Python package developed for easy, flexible, and powerful hyper-parameter grid search, logging, analysis, and graphing.

speek | Code *2024*
- speek (slurm-peek) is a Python CLI tool that lets you peek into Slurm resource info such as GPU availability, usage per user, job status, and more.

SKILLS

Natural languages: Korean (native), English (fluent, TOEIC: 960, TOEFL: 106)
Machine languages: Python, C, C++, Java | LaTeX, Markdown, typst
ML frameworks: Jax/Flax, Optax, PyTorch
Tools: Linux, Git, Slurm
Other interests: Piano, Coding/Toy projects (Leanprover, Vim), Video editing, Learning & chatting about {math, cs, physics, ...}

REFERENCES

Prof. Namhoon Lee, Assistant Professor at POSTECH | namhoon.lee@postech.ac.kr