

Jeongjae Lee

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RESEARCH INTERESTS

Generative Models, Reinforcement Learning

EDUCATION

Korea Advanced Institute of Science and Technology Sep 2025 - Present
Master of Science in Graduate School of Artificial Intelligence
Seoul, Republic of Korea
GPA: 4.3/4.3

Advised by Jong Chul Ye [Lab Page]

Seoul National University Mar 2019 - Aug 2024
Bachelor of Science in Electrical and Computer Engineering
Seoul, Republic of Korea
GPA: 4.20/4.3, Rank: 7/158, Summa Cum Laude

On leave for 3 semesters due to military service (Feb 2021 - Aug 2022)

Gyeonggi Science High School Mar 2016 - Feb 2019
High School Diploma
Suwon, Republic of Korea

RESEARCH EXPERIENCE

Unifying Reward-based Fine-tuning for Flow and Diffusion Models Dec 2025 - Apr 2026
Masters Student *KAIST AI*

- Developed a unified view of reward-based RL fine-tuning objectives for diffusion/flow models.
- Used insights from this framework to substantially accelerate existing methods.

Proportionate Credit Policy Optimization for T2I Alignment Mar 2025 - Nov 2025
Postbacc. Researcher & Masters Student *KAIST AI*

- *ICLR 2026* poster.
- Proposed a novel objective for diffusion/flow models that refines credit assignment of GRPO algorithm.
- Mitigated mode collapse in RL fine-tuning, achieving superior image diversity/fidelity and faster convergence compared to GRPO baselines.

Generative Models for Medical Data Sep 2024 - May 2025
Postbacc. Researcher *KAIST AI*

- Developed TimeVQVAE-based model to predict respiratory rates from PPG data (Co-op with Skylabs).
- Modified Wavelet-CycleGAN architecture to eliminate blob artifacts in Chest X-ray scatter correction (Co-op with DrTech).

Automated Control of Mechanical Ventilators in ICUs Jan 2023 - Dec 2023
Research Intern *Deepmetrics*

- Engineered predictive features for Optimal Decision Trees to automate ventilator control.
- Devised auto-screening method to exclude patient responses from drug interventions.
- Implemented a robust cross-validation pipeline to prevent overfitting on limited ICU patient data.

Foldseek: Fast and Sensitive Protein Structure Search Jun 2022 - Dec 2022
Research Intern *Seoul National University*

- Co-authored *Nature Biotechnology* (2400+ citations) for Foldseek, a cutting-edge protein search tool.

- Optimized LDDT alignment score computation using spatial hashing and SIMD instructions in C++, achieving a **13x single-core speedup** over Pymican.
- Designed and deployed the automated database update pipeline for the web server using Bash & Awk.

PUBLICATIONS & PREPRINTS

Jeongjae Lee*, Jinho Chang*, Jeongsol Kim[†], Jong Chul Ye[†]. 2026. Reward Score Matching: Unifying Reward-based Fine-tuning for Flow and Diffusion Models . *arXiv*. [paper] [project page]

Jeongjae Lee, Jong Chul Ye. 2026. PCPO: Proportionate Credit Policy Optimization for Aligning Image Generation Models. In *ICLR 2026*. [paper] [code]

Michel van Kempen, Stephanie S Kim, Charlotte Tumescheit, Milot Mirdita, **Jeongjae Lee**, Cameron LM Gilchrist, Johannes Söding, Martin Steinegger. 2023. Fast and accurate protein structure search with Foldseek. In *Nature Biotechnology* [paper]

HONORS AND AWARDS

Medical AI Scholarship Korea Health Industry Development Institute, 2022.9 - 2024.2
3 million KRW per semester, merit-based

Presidential Science Scholarship Korea Scholarship Foundation, 2019.3 - 2024.8
Full tuition plus 2.5 million KRW per semester, for talented students in science or engineering

Samsung HumanTech Paper Award Samsung, 2017.2
Bronze Prize, Biology, High School Sector

TECHNICAL SKILLS

- **Languages:** Python, Bash, C++, C
- **Libraries:** PyTorch, NumPy, Pandas, Scikit-learn

LANGUAGE PROFICIENCY

- **English:** Fluent (TOEFL: 117/120, GRE: V159 Q170 W5.5)
- **Korean:** Native