Jaa-Yeon Lee

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About Me

I am a 4th-year PhD student at KAIST AI, working on controllable generative AI. My research focuses on efficient multi-modal alignment for diffusion- and flow-based models, particularly throuh diffusion reinforcement learning (DiffusionRL). More recently, I have been extending this research to AR video diffusion models, aiming to improve controllability in video generation.

Work Experience

Disney Research Zurich — Nov 2025 – Jan 2026

- Research intern on the diffusion team, advised by Vinicius C. Azevedo.
- Contributed to diffusion model training and preprocessing tool development.

Education

PhD **KAIST**, Artificial Intelligence — Sep 2023 – *Present*

- BISPL Lab, under the supervision of Prof. Jong Chul Ye.

MS **KAIST**, Bio and Brain Engineering — Sep 2021 – Aug 2023

- MRI Lab, under the supervision of Prof. Sung-Hong Park.
- Worked on MRI Reconstruction and Metal-artifact Correction.

BS **Ewha Womans University**, Mechanical and Biomedical Engineering — Mar 2017 – Aug 2021
GPA: 4.09/4.5

- Dean's List (Top 10%, 5 semesters, 2018-2020)
- Medical AI & CV Lab, under the supervision of Prof. Jang-Hwan Choi, worked on Medical Image Analysis as a research intern.

Conferences

Alignment-Guided Score Matching for Text-to-Image Alignment in Diffusion Models — ICML, 2026 **Spotlight (top 2.2%)**
Jaa-Yeon Lee, Yeobin Hong*, Taesung Kwon, Jong Chul Ye.*

Aligning Text to Image in Diffusion Models is Easier Than You Think — NeurIPS, 2025
Jaa-Yeon Lee, Byunghee Cha*, Jeongsol Kim, Jong Chul Ye.*

MR Reconstruction in k-space using Vision Transformer boosted with Masked Image Modeling — ISMRM, 2023
Jaa-Yeon Lee, Sung-Hong Park.

Metal Artifact Correction MRI Using Multi-contrast Deep Neural Networks for Diagnosis of Degenerative Spinal Diseases — MICCAI Workshop, 2022
Jaa-Yeon Lee, Min A Yoon, Choong Guen Chee, Jae Hwan Cho, Sung-Hong Park.

NTIRE 2020 Challenge on Real Image Denoising: Dataset, Methods and Results — CVPR Challenge, 2020
A Abdelhamed, …, Jaa-Yeon Lee,…, et al.

Preprints

Policy Forcing: Learning KV Cache Masking Policy for AR Video Generation — Under Review
Jaa-Yeon Lee, Jong Chul Ye.*

UNICORN: Ultrasound Nakagami Imaging via Score Matching and Adaptation for Assessing Hepatic Steatosis — arXiv, 2026 Under Revision
Kwanyoung Kim Jaa-Yeon Lee*, Youngjun Ko, Gunwoo Lee, Jonghyon Yi, Jong Chul Ye.*

MindFormer: Semantic Alignment of Multi-Subject fMRI for Brain Decoding — arXiv, 2024
Inhwa Han, Jaa-Yeon Lee, Jong Chul Ye.

Journals

An unsupervised two-step training framework for LDCT denoising — Medical Physics, 2023
Wonjin Kim, Jaa-Yeon Lee, Jang-Hwan Choi.

Unsupervised Domain Adaptation for Low-dose Computed Tomography Denoising — IEEE Access, 2022
Jaa-Yeon Lee, Wonjin Kim*, Yebin Lee, Ji Yeon Lee, Eunji Ko, Jang-Hwan Choi.*

Wavelet Subband-specific Learning for Low-dose Computed Tomography Denoising — PLOS ONE, 2022
Wonjin Kim, Jaa-Yeon Lee, Mihyun Kang, Jin Sung Kim, Jang-Hwan Choi.

Patents

Ultrasound Nakagami Imaging via Score Matching and Adaptation — No.10-2024-0038587, Filed: Mar 2024
Jong Chul Ye, Kwanyoung Kim, Jaa-Yeon Lee.

Ultrasound Imaging System and Method for Controlling Thereof — No.10-2025-0023822, Filed: Feb 2025
Jong Chul Ye, Jaa-Yeon Lee, Jinho Chang, Youngjun Ko, Gunwoo Lee, Jonghyon Yi.

Awards

Gold Prize, KoSAIM Oral Presentation — Oct 2024

- Korea Society of Artificial Intelligence in Medicine
- Presented *UNICORN: Ultrasound Nakagami Imaging via Score Matching and Adaptation for Assessing Hepatic Steatosis*

Bronze Prize, IPIU Oral Presentation — Feb 2022

- 34th Workshop on Image Processing and Image Understanding
- Presented *Unsupervised Domain Adaptation for LDCT Denoising*

Projects

Industrial Research Project: 4D TEE Segmentation — Sep 2026 - Present

- Participated in an industry-sponsored project funded by *Samsung Medison*
- Developing AI tools for real-time 4D cardiac segmentation.

National Research Project: Development of Foundation AI Models for Dementia — Sep 2023 - *Present*

- Participated in a project supported by the *National Research Foundation of Korea (RS-2023-00262527)*
- Developed *an image encoder for multi-contrast PET imaging*

Industrial Research Project: Ultrasound PDFF Quantification — Sep 2023 - Jan 2025

- Participated in an industry-sponsored project funded by *Samsung Medison*
- Developed AI tools for *quantifying Proton Density Fat Fraction (PDFF) from Ultrasound raw data.*

Facial Expression Recognition for Real-Time Online Lectures — GitHub, 2020

- Led a capstone project focused on building AI tools for *students' live lecture comprehension analysis*

Academic Activities

Teaching Assistant

- KAIST AI619 - AI for Medical Imaging and Signals (2024F, 2026S)
- KAIST BiS351 - Bio-Signal Processing (2022S, 2023S)
- KAIST BiS452 - Biomedical Imaging (2021F, 2022F)

Reviewer

- CVPR 2026, ICML 2026, CVPR 2027

Skills

Technical Skills: Python, PyTorch, MATLAB