

# Jonghyun Lee (Thomas Lee)

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AI Research Scientist

Generative Models, Diffusion (Score-Based) Models

 [GitHub](#)

 [LinkedIn](#)

 [Blog](#)

## EDUCATION

### Korea University

*M.S. in Industrial Management Engineering*

August 2024, expected

*Current GPA: 4.13/4.5*

### Korea University

*B.S. in Industrial Management Engineering*

August 2022

*GPA: 3.2/4.5*

### Jakarta International School

*High School Diploma, International Baccalaureate (IB) Program*

June 2015

## COURSEWORK

**Courses:** Computer Vision, Theories and Applications of Deep Learning, Cloud Computing, Unstructured Data Analysis, Principles and Applications of Machine Learning, Business Analytics

## SKILLS

**Python Libraries:** PyTorch, OpenCV, Detectron2, Torchvision, Diffusers, Transformers, Einops, NumPy, Pandas

**Tools:** Git/GitHub, Docker, Unix Shell, CUDAToolkit, VS Code, Slack, Obsidian

## PUBLICATIONS

### [ICLR 2024] Compose and Conquer: Diffusion-Based 3D Depth Aware Composable Image Synthesis

- First Author, accepted to ICLR 2024, poster
- Developed a training paradigm called *DDS* (Depth Disentanglement Training) that allows a diffusion model to identify the absolute three-dimensional position of unseen/obstructed objects
- Proposed an inference algorithm called *Soft Guidance* that imposes global semantics onto targeted regions without the use of any additional localization cues
- Developed and trained a diffusion model that combines DDS and Soft Guidance, *Compose and Conquer* (CnC), capable of synthesizing images with localized multiple conditions in a disentangled manner

### [ICLR 2024] Noise Map Guidance: Inversion with Spatial Context for Real Image Editing

- Second Author, accepted to ICLR 2024, poster
- Aided developing *Noise Map Guidance*, a diffusion PF-ODE inversion method designed for real image editing

### [CVPR 2024, under review] One-Shot Structure-Aware Stylized Image Synthesis

- Second Author, under review at CVPR 2024
- Aided developing a diffusion model capable of style transfer with a single exemplar image (One shot stylization)

## AWARDS AND HONORS

### AI Spark Challenge | Final Selection

Apr. 2022

*Ministry of Science and ICT lead AI Tournament*

Leader of team IRDIS, developed and trained a satellite-image segmentation model, developed a disaster response solution ranking areas in need of immediate rescue via segmentation maps and the Analytical Hierarchy Process

### KUIAI Hackathon | 3rd Place in Finals/20 teams

Jan. 2022

*Korea Electronics Technology Institute (KETI) lead AI Hackathon*

Leader of team Journey Lee, developed and serviced a Multi-polygon map based AI Location recommendation system for optimal commercial success of startups

### Smart Campus Datathon | 2nd Place in Finals/15 teams

Sep. 2021

*Korea University Datahub lead AI Datathon*

Leader of team Peachtree, developed and serviced an unsupervised embedding model based scholarship parsing/recommendation system for Undergrad. Students in Korea University

### K-Data Datacampus | 2nd Place in Finals/40 teams

Sep. 2021

*Korea Data Agency lead AI Tournament*

Leader of team Gillajabi, developed and trained a transformer based Audio-Image Korean phoneme recognition model, developed a Levenshtein distance based character-error rate (CER) metric, serviced a web-app for Korean word pronunciation correction

## WORK EXPERIENCE

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**NAVER Cloud** | Intern

Jun. 2023 - Dec. 2023

- AI Researcher, Creativity LAB, ImageVision Team
- Research, architecture design, training, and deployment of composable image synthesis diffusion models
- PoC. of real image editing and style transfer via diffusion models

## PROJECTS

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**Project Lifecycle Management (PLM) System LLM Development** | Hyundai Mobis    Mar. 2023 - Nov. 2023

- Preprocessed unstructured document/text data from Hyundai Mobis's PLM system, trained a custom KoBERT model with additional pooling heads for embedding PLM text queries
- Developed an embedding similarity based algorithm that queries text input and PLM documents through a graph-based visualization interface

**Graph Neural Network Based Recommendation System Development** | Korea Univ.    Sep. 2022 - Dec. 2022

- Developed and trained a SentenceBERT model for embedding coursework data of Korea University
- Developed a Directed Multigraph of student/coursework relationships via Bayesian Inference
- Trained a GraphSAGE (GNN) recommendation model that recommends future coursework for students based on past coursework and coursework reviews

## EXTRA-CURRICULAR ACTIVITIES

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**Founders** | Founding Member, Society President

Feb. 2022 - Jan. 2024

Founding Member of *Founders*: A Startup Academic Society for students in Seoul National University, Yonsei University, Korea University, KAIST, POSTECH

## LANGUAGE SKILLS

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**English** | Native

TOEIC ETS: 975

OPIc: AL (Advanced Low)