

# Seungyong Lee

AI Research Engineer — Computer Vision & Generative AI

✉ sylee0802@kaist.ac.kr   🌐 ryan-seungyong-lee   in ryanl22   🌐 ryan-seungyong-lee.github.io

## Research Interests

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Controllable Image Generation & Editing, Vision–Language Models, Physical AI, Scalable AI Systems

## Education

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**Korea Advanced Institute of Science and Technology (KAIST)**

*Feb 2018 – Present*

B.S. in Mathematics and Electrical Engineering (Double Major)

GPA: 3.82 / 4.30

Advisor: Prof. Mincheol Shin

**New York University – College of Arts & Science (Visiting Student)**

*Aug 2023 – Dec 2023*

GPA: 4.0 / 4.0

## Publications

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**Voost: A Unified and Scalable Diffusion Transformer for Bidirectional Virtual Try-On and Try-Off** (arXiv:2508.04825)

*Seungyong Lee\**, Jeong-gi Kwak\*

**ACM SIGGRAPH Asia 2025**

**Unified Diffusion Transformer for Bidirectional Virtual Try-On and Try-Off**

*Seungyong Lee\**, Jeong-gi Kwak\*

**CVPR 2025 Workshop — AI for Creative Visual Content Generation, Editing, and Understanding**

**Fashion Style Editing with Generative Human Prior** (arXiv:2404.01984)

Chaerin Kong\*, *Seungyong Lee\**, Soohyeok Im\*, Wonsuk Yang\*

## Experience

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**AI Research Engineer & Founding Member**, NXN Labs — Seoul, South Korea   *Aug 2023 – Present*

*Keywords: Virtual-TryOn, Diffusion, Multi-context Image Editing, Depth-aware Segmentation, VLM, k8s*

- Led development of **Voost**, a unified diffusion transformer for bidirectional virtual try-on and try-off (1st author, SIGGRAPH Asia 2025), and built a **Kubernetes-based microservice inference system** to serve it as a scalable API powering the public **Hugging Face demo** (100K+ visits in one month; ranked #4 in Trending Spaces of the Week).
- **Implemented 3D avatar generation** using SMPL, HMR, and Blender pipelines for photorealistic human reconstruction.
- Improved large-scale training efficiency through **NVIDIA Nsight**, **Slurm multi-node scheduling**, and **FAISS-based retrieval**.
- Built a scalable **database automation pipeline** using fine-tuned VLM agents for automated image–metadata preprocessing and ingestion.
- Defined and trained **Depth-aware Image Segmentation** and **Visual Prompt Instance Segmentation** models using a 10 K proprietary dataset.

- Supervised and mentored **four engineer interns**, managing data pipelines, model integration, and deployment strategies.

**AI Research Scientist Intern**, Lunit (Oncology Dept. – Model-Centric AI Team) — Seoul, South Korea *Jan 2023 – Jul 2023*

- Explored ViT-family encoders and advanced DETR-style decoders (Mask DINO, DAB-DETR) for pathology segmentation.
- Proposed a Multi-FoV Transformer improving contextual reasoning and achieved +2.5 mIoU / +3.9 mF1 over baseline.

**Undergraduate Researcher**, ALIN-LAB (KAIST, Prof. Jinwoo Shin) *Aug 2022 – Dec 2022*

- Conducted research on self-supervised learning and Transformer-based segmentation frameworks (SAM/ESAM).

**Co-op Intern**, Koh Young Technology — R&D Center, Machine Vision Lab *Aug 2020 – Feb 2021*

- Implemented PCB foreign material detection using classical ML (SVM, Ensemble Trees) and U-Net segmentation.

**Republic of Korea Army (Signal Intelligence Unit)** *Mar 2021 – Sep 2022*  
Developed and maintained an internal intranet platform used by over 200 personnel.

## Technical Skills

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**Languages:** Python, C++, Bash

**Frameworks:** PyTorch, Diffusers, Transformer, Accelerate, FSDP, Slurm, FastAPI, Docker, k8s

**Tools:** GitHub, JIRA, AWS, GCP, Gradio, ComfyUI, W&B, Hydra, FAISS, Nsight Systems

## Leadership & Mentorship

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- Mentored four AI engineer interns at NXN LABS on data-centric modeling and scalable deployment.
- President, KAIST Mathematical Problem Solving Group (2019).

## Languages

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Korean (Native)    English (Fluent; TOEIC 965 / 990, Apr 2022)