

Professional Summary

Lead AI researcher behind **VARCO 3D**, NC AI's production 3D asset generation service (20K+ users, 150K+ assets), with end-to-end ownership from research direction to deployed model behavior. Specialized in **3D generative modeling** and **neural rendering**—spanning 3D latent diffusion, textured mesh generation, NeRF, Gaussian splatting, and game-engine-integrated rendering—with publications at **ICML** and **CVPR**, and invited talks at KAIST and Korean government ministries.

Core Expertise

3D Generation	3D asset generation, geometry generation, texture synthesis, latent diffusion, DiT-based generative models, native 3D representations
Neural Rendering	Neural Radiance Fields, 3D Gaussian splatting, rendering integration in graphical engines
ML Systems	PyTorch, CUDA, multi-node large-scale model training, diffusion/flow model training/inference optimization, data pipeline design
Graphics / 3D	Mesh processing, SDF, textured meshes, Blender, Three.js, game-engine rendering workflows

Experience

Lead AI Researcher Feb 2025 – Present
NC AI, VARCO3D Team

- Lead core generative modeling for **VARCO 3D**, a production-scale 3D asset generation system, owning end-to-end design and deployment of its models.
- Scaled training and inference for large-scale 3D generative models to multi-billion parameters on 64+ A100/H100 GPUs while keeping the system within production cost and latency budgets.
- Delivered 23% improvement in geometric fidelity (Chamfer Distance) and 74% reduction in inference latency over the previous baseline through architectural and inference-time redesign.
- Direct core generative modeling research across 3D latent representation design, large-scale diffusion training, and inference-time controllability for production deployment.
- Drive evaluation-driven iteration and deployment-aware design, translating internal research into shipped product capabilities.

AI Researcher Mar 2023 – Feb 2025
NCSOFT AI Lab, 3D Generation & Neural Rendering Team (now NC AI)

- Researched 3D asset generation, 3D latent diffusion, and texture synthesis for game-content production workflows; this research line led to **CaPa**, a 4K textured mesh generation pipeline.
- Developed neural-rendering workflows for graphical-engine integration and interactive 3D scene representation, demonstrated in NCSOFT's AI-based 3D rendering project.

AI Researcher, Intern Jul 2022 – Dec 2022
NAVER AI Lab, Mentor: Jin-Hwa Kim, Ph.D.

- Researched robust camera pose refinement for multi-resolution hash encoding in NeRF, addressing reconstruction instability under noisy poses; published at **ICML 2023**.

Selected Work

VARCO3D: NC AI's 3D Asset Generation Service Jul 2024 – Present
NC AI | [Project link](#)

- Production 3D generation service used by 20K+ users with 150K+ assets generated, supporting geometry, texture, and asset-level quality workflows.

AI-based 3D Rendering in Game Engine May 2023 – Dec 2023
NCSOFT Research | [Project link](#)

- Neural-rendering project focused on graphical-engine integration and interactive 3D scene representation; demonstrated radiance-field rendering inside a real-time engine pipeline.

Selected Publications

CaPa: Carve-n-Paint Synthesis for Efficient 4K Textured Mesh Generation

H. Heo, J. Kim, S. Lee, J. Wi, J. Choi, S. Ahn*

Technical Report | [Link](#)

Efficient high-resolution textured mesh generation pipeline for production-oriented 3D asset creation.

Robust Camera Pose Refinement for Multi-Resolution Hash Encoding

H. Heo, T. Kim, J. Lee, J. Lee, S. Kim, H. J. Kim*, JH. Kim*

ICML 2023 | [Link](#)

Camera pose refinement for NeRF-style multi-resolution hash encoding under pose noise and reconstruction instability.

Semantic-aware Occlusion Filtering Neural Radiance Fields in the Wild

J. Lee, I. Kim, H. Heo, H. J. Kim*

Preprint | [Link](#)

Semantic filtering strategy for more robust in-the-wild neural radiance field reconstruction.

Consistency Learning via Decoding Path Augmentation for Transformers in Human Object Interaction Detection

J. Park, S. Lee, H. Heo, H. Choi, H. J. Kim*

CVPR 2022 | [Link](#)

Transformer-based human-object interaction detection with consistency learning through decoding-path augmentation.

Temporally Sparse Adversarial Perturbations on Videos

H. Heo, D. Ko, J. Lee, Y. Hong*, H. J. Kim*

IEEE Access 2021 | [Link](#)

Video adversarial perturbation method with temporally sparse attack structure.

Education

M.S. in Computer Science & Engineering

Sep 2020 – Feb 2023

Korea University, Seoul | Advisor: Prof. Hyunwoo J. Kim (MLV Lab)

Publications during M.S.: ICML 2023, CVPR 2022, IEEE Access 2021, GPA 4.3/4.5

B.S. in Computer Science & Engineering

Mar 2015 – Aug 2020

Korea University, Seoul

Professional Activities

Invited Talks

- An Introduction to 3D Generative AI – KAIST, Mar 2026
- Spatial 3D AI Technology and its Applications – Ministry of Land, Infrastructure and Transport, Korea, Sep 2025
- Radiance Fields and Spatial 3D AI for Digital Twin – National Geographic Information Institute, Korea, Aug 2025
- Rasterization vs. Ray Tracing with 3D Gaussian Primitives – NCSoft Developer Seminar, Sep 2024
- Joint Optimization of Camera Pose and Accelerated Radiance Fields – NAVER Cloud, Mar 2023