

Seunghyeon Seo

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EDUCATION

Seoul National University, Seoul, Korea	Mar. 2021 ~ Aug. 2025
- Ph.D. in Artificial Intelligence	
Seoul National University, Seoul, Korea	Mar. 2014 ~ Feb. 2021
- B.A. in Agricultural Economics / Data Sciences	
Institut d'Études Politiques de Paris (Sciences Po), Paris, France	Jan. 2019 ~ Jun. 2019
- Exchange Student Program	

RESEARCH INTERESTS

I am deeply engaged in developing efficient deep learning models for training and inference, aimed at practical real-world applications. Primarily, my research interest focuses on **improving the performance of NeRF and Gaussian Splatting given sparse input data** by various regularization methods, such as exploiting input data distribution, augmenting training rays, designing an effective ray parameterization, etc. In addition, I have recently developed a growing interest in **synthetic data training using generative models**, which further enhances my research focus on data efficiency and model robustness. Beyond these topics, I also maintain a broad curiosity and open-mindedness toward diverse areas of CV/ML/NLP.

PUBLICATIONS

- [1] Shaojie Bai*, **Seunghyeon Seo***, Yida Wang, Chenghui Li, Owen Wang, Te-Li Wang, Tianyang Ma, Jason Saragih, Shih-En Wei, Nojun Kwak, Hyung Jun Kim, [“Generative Head-Mounted Camera Captures for Photorealistic Avatars”](#), *SIGGRAPH Asia 2025*. **(Journal Track)**
- [2] Yeonjin Chang, Erqun Dong, **Seunghyeon Seo**, Nojun Kwak, Kwang Moo Yi, [“ROODI: Reconstructing Occluded Objects with Denoising Inpainters”](#), Under Review.
- [3] Ingyun Lee, Jae Won Jang, **Seunghyeon Seo**, Nojun Kwak, [“DivCon-NeRF: Generating Augmented Rays with Diversity and Consistency for Few-shot View Synthesis”](#), Under Review.
- [4] **Seunghyeon Seo**, Yeonjin Chang, Jayeon Yoo, Seungwoo Lee, Hojun Lee, Nojun Kwak, [“ARC-NeRF: Area Ray Casting for Broader Unseen View Coverage in Few-shot Object Rendering”](#), *CVPR 2025 Workshop*. **(Oral)**
- [5] Donghoon Han*, **Seunghyeon Seo***, Eunhwan Park, SeongUk Nam, Nojun Kwak, [“Unleash the Potential of CLIP for Video Highlight Detection”](#), * indicates equal contribution, *CVPR 2024 Workshop*.
- [6] Yeonjin Chang, Yearim Kim, **Seunghyeon Seo**, Jung Yi, Nojun Kwak, [“Fast Sun-aligned Outdoor Scene Relighting based on TensoRF”](#), *WACV 2024*.
- [7] Donghoon Han, **Seunghyeon Seo**, DongHyeon Jeon, Jiho Jang, Chaerin Kong, Nojun Kwak, [“ConcatPlexer: Additional Dim1 Batching for Faster ViTs”](#), *NeurIPS 2023 Workshop*. **(Oral)**
- [8] **Seunghyeon Seo**, Yeonjin Chang, Nojun Kwak, [“FlipNeRF: Flipped Reflection Rays for Few-shot Novel View Synthesis”](#), *ICCV 2023*.
- [9] **Seunghyeon Seo**, Jaeyoung Yoo, Jihye Hwang, Nojun Kwak, [“MDPose: Real-Time Multi-Person Pose Estimation via Mixture Density Model”](#), *UAI 2023*.
- [10] Jaeyoung Yoo*, Hojun Lee*, **Seunghyeon Seo**, Inseop Chung, Nojun Kwak, [“End-to-End Multi-Object Detection with a Regularized Mixture Model”](#), * indicates equal contribution, *ICML 2023*.
- [11] **Seunghyeon Seo**, Donghoon Han*, Yeonjin Chang*, Nojun Kwak, [“MixNeRF: Modeling a Ray with Mixture Density for Novel View Synthesis from Sparse Inputs”](#), * indicates equal contribution, *CVPR 2023*. **(Qualcomm Innovation Fellowship Korea 2023 Winner)**
- [12] Jongmok Kim, Jooyoung Jang, **Seunghyeon Seo**, Jisoo Jeong, Jongkeun Na, Nojun Kwak, [“MUM: Mix Image Tiles and UnMix Feature Tiles for Semi-Supervised Object Detection”](#), *CVPR 2022*.
- [13] Kyuewang Lee*, Inseop Chung*, Daeho Um, Jaeseok Choi, Yeji Song, **Seunghyeon Seo**, Nojun Kwak, Jin Young Choi, “Multi-modal Object Detection, Tracking, and Action Classification for Unmanned Outdoor Surveillance Robots”, *ICCAS 2021*.

WORK EXPERIENCE

Meta Reality Labs, Burlingame, CA | *Research Scientist Intern*

May 2025 ~ Aug. 2025

- XRCIA, Datasets (Mentors: John Kim, Lei Xiao, Beibei Liu)
- Research about synthetic egocentric data generation with high-quality body extremities using video diffusion transformer models.
- Leveraged Wan 2.1 video diffusion model with LoRA fine-tuning to adapt generative outputs for egocentric perspectives.

Meta Reality Labs, Burlingame, CA | *Research Scientist Intern*

Jul. 2024 ~ Jan. 2025

- XRCIA, Datasets (Mentors: John Kim, Shaojie Bai, Tianyang Ma)
- Research about synthetic data generation using conditional multi-view diffusion models, and training framework of universal face encoder leveraging real+synthetic data.
- Successfully reduced the cost of data collection by over an order of magnitude compared to traditional real-world capture workflows.
- Built a high-quality synthetic dataset used alongside real data to train a universal face encoder, resulting in over 5% improvement on key metrics, surpassing the current best model.

ThinkforBL Consulting Group, Seoul, Korea | *Laboratory Assistant Researcher*

Jun. 2020 ~ Nov. 2020

- Development of deep learning-based solutions for agriculture, addressing diverse client requests and implementing models, e.g., posture detection in sows, crop weight classification, and recommendation systems.

Food and Agriculture Organization of the United Nations (FAO), Rome, Italy | *Intern*

Sep. 2019 ~ Feb. 2020

- Committee on World Food Security (CFS) (Supervisor: Christopher Hegadorn)
- Research and report on datasets that are relevant to the proposed CFS workstream on <Data Collection and Analysis Tools>.

PROJECTS

Research on Novel View Synthesis Using NeRF Trained with Sparse Viewpoint Data

Funded by Samsung Electronics | Main Researcher

Jul. 2023 ~ Jul. 2024

- Neural rendering, NeRF, Few-shot learning
- Conducted research to improve the performance of NeRF under sparse input conditions, resulting in a published research paper at a top-tier computer vision conference.

Artificial Intelligence Research about Cross-Modal Dialogue Modeling for One-on-One Multi-Modal Interactions

Funded by Ministry of Science and ICT of Korea | Assistant Researcher

May 2022 ~ Jun. 2023

- Multi-modal learning, Object detection
- Assisted in building an object detection system that processes user-submitted images to identify clothing items and extract key attributes.

Development of Real-Time Multi-Camera Object Tracking and Identification Technology

Funded by Electronics and Telecommunications Research Institute | Project Manager

Jun. 2021 ~ Dec. 2021

- Multi-object tracking
- Developed a multi-view, multi-object tracking algorithm for real-time vehicle and pedestrian tracking within a parking lot environment.

Development of Multimodal Sensor-Based Intelligent Systems for Outdoor Surveillance Robots

Funded by Ministry of Science and ICT of Korea | Assistant Researcher

Jan. 2021 ~ Aug. 2021

- Multi-modal learning, Object detection
- Contributed to a research project on multi-modal object detection, tracking, and action classification for autonomous outdoor surveillance robots.

TALK

Enhancing Few-shot Novel View Synthesis with Different Ray Processing Strategies in NeRF

Jul. 2025

- Meta Reality Labs

Generative Head-Mounted Camera Captures for Photorealistic Avatars

Jun. 2025

- Meta Reality Labs

Novel View Synthesis from Sparse Inputs via NeRF

Apr. 2025

- SNU Haedong Advanced Engineering

ACADEMIC SERVICE

Program Committee for AAAI '25/'26

Reviewer for CVPR '23/'24/'25/'26, ECCV '24, ICCV '25, NeurIPS '25, TCSVT

AWARDS AND SCHOLARSHIPS

Outstanding Dissertation Award	Aug. 2025
- Seoul National University	
Outstanding Reviewer Award	Sep. 2024
- ECCV 2024	
Qualcomm Innovation Fellowship Korea 2023 Winner	Nov. 2023
- Qualcomm AI Research	
Youlchon AI Star Scholarship	Aug. 2023
- Youlchon Foundation & AI Institute-Seoul National University	
AI Fellowship (Fully Funded)	Mar. 2022 ~ Feb. 2023
- Seoul National University	
Overseas Agriculture Sector Intern Scholarship	Sep. 2019 ~ Dec. 2019
- Ministry of Agriculture, Food and Rural Affairs	
Exchange Student Scholarship	Jan. 2019
- Mirae Asset Park Hyeon Joo Foundation	
3rd Place as a Team, Agdata Lab (Service Development Field)	Sep. 2018
- Entrepreneurship Competition Utilizing Agricultural Data / EPIS	

PATENT

Method and Apparatus based on NeRF using Flipped Reflected Ray, Korean Patent, 10-2024-0022118

SKILLS

Programming Languages

- Python, R, CUDA

ML Development Stack

- PyTorch, Jax, Tensorflow, Slurm, MAST Scheduler

Language

- English (Professional), Korean (Native), French (Basic)