Seunghyeon Seo

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EDUCATION

Seoul National University, Seoul, Korea   Mar. 2021 ~ Aug. 2025 (expected)
- Ph.D. Candidate 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 (Economics)

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 for 3D models using conditional diffusion models**, which further enhances my research focus on data efficiency and model robustness.

PUBLICATIONS

[1] Yeonjin Chang, Erqun Dong, **Seunghyeon Seo**, Nojun Kwak, Kwang Moo Yi, "ROODI: Reconstructing Occluded Objects with Denoising Inpainters", Under Review.

[2] 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.

[3] **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*.

[4] 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*.

[5] Yeonjin Chang, Yearim Kim, **Seunghyeon Seo**, Jung Yi, Nojun Kwak, "Fast Sun-aligned Outdoor Scene Relighting based on TensoRF", *WACV 2024*.

[6] Donghoon Han, **Seunghyeon Seo**, DongHyeon Jeon, Jiho Jang, Chaerin Kong, Nojun Kwak, "ConcatPlexer: Additional Dim1 Batching for Faster ViTs", *NeurIPS 2023 Workshop*. **(Oral)**

[7] **Seunghyeon Seo**, Yeonjin Chang, Nojun Kwak, "FlipNeRF: Flipped Reflection Rays for Few-shot Novel View Synthesis", *ICCV 2023*.

[8] **Seunghyeon Seo**, Jaeyoung Yoo, Jihye Hwang, Nojun Kwak, "MDPose: Real-Time Multi-Person Pose Estimation via Mixture Density Model", *UAI 2023*.

[9] 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*.

[10] **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)**

[11] 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*.

[12] 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   Jul. 2024 ~ Jan. 2025
- XRCIA, Datasets (Mentors: John Kim, Shaojie Bai, Tianyang Ma)
- Research about synthetic image generation using conditional multi-view diffusion models for improving training data efficiency.

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 such as 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>

AWARDS AND SCHOLARSHIPS

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

The Army Achievement Medal   Jan. 2017
- Department of the Army, USA

PROJECTS

Research on Novel View Synthesis Using NeRF Trained with Sparse Viewpoint Data
Funded by Samsung Electronics | Main Researcher   Jul. 2023 ~ Jul. 2024
- Few-shot NeRF

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
- Object Detection

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

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
- Object Detection

PATENT

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

TALK

Novel View Synthesis from Sparse Inputs via NeRF   Apr. 2025
- SNU Haedong Advanced Engineering Center

ACADEMIC SERVICE

Program Committee for AAAI 2025
Reviewer for CVPR 2023~2025, ECCV 2024, ICCV 2025, TCSVT