

# Seunghyeon Seo

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## EDUCATION

**Seoul National University, Seoul, Korea**  
Ph.D. Candidate in Artificial Intelligence

Mar. 2021 ~ Aug. 2025 (expected)

**Seoul National University, Seoul, Korea**  
B.A. in Agricultural Economics / Data Sciences

Mar. 2014 ~ Feb. 2021

**Institut d'Études Politiques de Paris (Sciences Po), Paris, France**  
Exchange Student Program (Economics)

Jan. 2019 ~ Jun. 2019

## 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.

## 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>

## RESEARCH EXPERIENCE

**@ Machine Intelligence and Pattern Analysis Laboratory (MIPAL), Seoul, Korea**

Mar. 2021 ~ Present

**Seunghyeon Seo, Yeonjin Chang, Jayeon Yoo, Seungwoo Lee, Hojun Lee, Nojun Kwak**, “ARC-NeRF: Area Ray Casting to Cover Continuous Unseen Views for Few-shot Object Rendering”, Under Review.

**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.

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*.

Yeonjin Chang, Yearim Kim, **Seunghyeon Seo**, Jung Yi, Nojun Kwak, [“Fast Sun-aligned Outdoor Scene Relighting based on TensoRF”](#), *WACV 2024*.

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

**Seunghyeon Seo**, Yeonjin Chang, Nojun Kwak, [“FlipNeRF: Flipped Reflection Rays for Few-shot Novel View Synthesis”](#), *ICCV 2023*.

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

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*.

**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)

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*.

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*.

## **AWARDS AND SCHOLARSHIPS**

<b>Outstanding Reviewer Award</b> ECCV 2024	Sep. 2024
<b>Qualcomm Innovation Fellowship Korea 2023 Winner</b> Qualcomm AI Research	Nov. 2023
<b>Youlchon AI Star Scholarship</b> Youlchon Foundation & AI Institute-Seoul National University	Aug. 2023
<b>AI Fellowship (Fully Funded)</b> Seoul National University	Mar. 2022 ~ Feb. 2023
<b>Overseas Agriculture Sector Intern Scholarship</b> Ministry of Agriculture, Food and Rural Affairs	Sep. 2019 ~ Dec. 2019
<b>Exchange Student Scholarship</b> Mirae Asset Park Hyeon Joo Foundation	Jan. 2019
<b>3<sup>rd</sup> Place as a Team, Agdata Lab (Service Development Field)</b> Entrepreneurship Competition Utilizing Agricultural Data / EPIS	Sep. 2018
<b>The Army Achievement Medal</b> Department of the Army, USA	Jan. 2017

## **PATENTS**

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

## **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

## **OTHER EXPERIENCE**

### **Academic Service**

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

### **Jecheon International Music & Film Festival | Volunteer**

Aug. 2017

- Interpreter / schedule manager of *Mr. Etienne Comar*, the director of film *Django* (2017)

### **KATUSA (Mandatory Military Service) | Administrative Specialist**

Apr. 2015 ~ Jan. 2017

- Squad Leader / Operator in Combined Joint Provost Marshal (CJPM)

## **SKILLS**

### **Language**

Korean, English (Advanced), French (Intermediate)

### **Programming Languages**

Python, R, C++ (basic)

### **Programming Frameworks**

JAX, PyTorch, Tensorflow

## **REFERENCE**

### **NOJUN KWAK, PH.D.**

Professor,

Program in Intelligent Systems,

Department of Transdisciplinary Studies,

Seoul National University, Republic of Korea

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