

# Seoha Kim

RESEARCHER ON 4D SCENE RECONSTRUCTION

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## Summary

**Research Interest** 4D Scene Reconstruction, Scene Understanding  
**Current Focus** Dynamic Gaussian Splatting, 4D Action Localization

## Publications

### Per-Gaussian Embedding based Deformation for Deformable 3D Gaussian Splatting

2024

JEONGMIN BAE\*, **SEOHA KIM\***, YOUNGSIK YUN, HAHYUN LEE, GUN BANG, YOUNGJUNG UH

Under review

- This paper aims to represent 4D Gaussian Splatting employing per-Gaussian deformation. Existing coordinate-based deformable Gaussian splatting fails to reconstruct dynamic scenes accurately due to the capacity limitations of the deformation field. The method solves the problem using per-Gaussian latent embeddings to predict deformation for each Gaussian and achieves a clearer representation of dynamic motion.

### Sync-NeRF: Generalizing Dynamic NeRFs to Unsynchronized Videos

2024

**SEOHA KIM\***, JEONGMIN BAE\*, YOUNGSIK YUN, HAHYUN LEE, GUN BANG, YOUNGJUNG UH

AAAI 2024

- This paper aims to reconstruct 4D dynamic scenes from the *unsynchronized* multi-view videos. In the unsynchronized setting, the existing dynamic NeRFs fail to reconstruct the dynamic scene and struggle to fit even the training views. The method proposes learnable time offsets for adjusting temporal gaps in the training views and introduces two approaches for modeling temporal embedding.

## Education

### Yonsei University

2022 - 2024

M.S. in Artificial Intelligence supervised by Prof. Youngjung Uh

Seoul, South Korea

### Yonsei University

2015 - 2021

B.A. Double major in Business Administration and Cognitive Science

Seoul, South Korea

## Work Experience

### Machine Learning Engineer, Plask

2021.3 - 2021.8

- Improving the accuracy of 3D pose estimation from videos, reviewing and implementing State-of-the-Art 3D papers.

### Internship in Data Scientist, Hyundai Mobis

2019.9 - 2020.2

- Improving the accuracy of defect classification on 3 kinds of structured factory data: Vibration motor noise, CT pattern, and auto-insert solder line process data.

## Industrial Projects

### ETRI (Electronics and Telecommunications Research Institute)

2023.01 - 2024.06

ACADEMIC-RESEARCH COOPERATION

- Researching Dynamic Gaussian Splatting. It achieves high-quality novel view synthesis in dynamic regions introducing novel representation.
- Researching Dynamic NeRFs from the *unsynchronized* multi-view videos. It improves the ease of data preparation and the quality of the results.

### LG Display

2022.2 - 2022.12

ACADEMIC-INDUSTRIAL COOPERATION

- Researching knowledge distillation for panel defects classification. It improves the accuracy of fine-grained image classification, distilling similarity between patch-level feature maps.

## Patents

KR 10-2024-0043684 Method and apparatus for Dynamic Gaussian Splatting using embedding-based deformation 2024

KR 10-2023-0105173 Method and apparatus for representing dynamic neural radiance fields from unsynchronized videos 2023

KR 10-2020-0022362 Apparatus of diagnosing noise quality of motor 2020

## Awards

AID Korea **1st place Minister's Award** Animal Datathon Korea - Cow keypoint detection 2021

Kaggle **Top 2% Silver Medal** Cassava leaf disease classification - Image classification 2021

SNU Hospital **5th place** Sleep AI Challenge - Sleep stages classification through polysomnography result images 2021