Seoha Kim

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Summary

Research Interest 4D Reconstruction, 3D Scene Understanding, Robot Perception and Navigation

Current Focus 4D Reconstruction with Egocentric Video, 4D Action Understanding

Publications

Per-Gaussian Embedding based Deformation for Deformable 3D Gaussian Splatting *ECCV 2024*

Jeongmin Bae*, **Seoha Kim***, Youngsik Yun, Hahyun Lee, Gun Bang, Youngjung Uh

- This paper aims to represent 4D dynamic scene employing per-Gaussian deformation. 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 *AAAI 2024*

Seoha Kim*, Jeongmin Bae*, Youngsik Yun, Hahyun Lee, Gun Bang, Youngjung Uh

- This paper aims to reconstruct 4D dynamic scenes from the *unsynchronized* multi-view videos. The method proposes learnable time offsets for adjusting temporal gaps in the training views and introduces two approaches for modeling temporal embedding.

Rethinking Open-Vocabulary Segmentation of Radiance Fields in 3D Space *Under Review*

Hyunjee Lee*, Youngsik Yun*, Jeongmin Bae, **Seoha Kim**, Youngjung Uh

- This paper aims to revisit the problem set of 3D semantic understanding. The method directly supervise the 3D points to train the language embedding field. By transferring the pre-trained language field to 3DGS, it achieves *real-time* rendering speed for the first time.

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

Data Scientist Intership, Hyundai Mobis *2019.9 – 2020.2*

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

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*