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

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*

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.

Optimizing Dynamic NeRF and 3DGS with No Video Synchronization *ECCV 2024 Wild3D*

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

- This paper aims to reconstruct dynamic NeRFs and 3DGS from the unsynchronized multi-view videos. This paper is the extension of the previously accepted paper 'Sync-NeRF: Generalizing Dynamic NeRFs to Unsynchronized Videos' and is currently under review in the journal.

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.

Research Experience

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.

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.

Data Scientist Internship, Hyundai Mobis *2019.9 – 2020.2*

- Improving the accuracy of defect classification on structured factory datasets: motor noise, CT pattern, and solder line.

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*