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 *Submitted to ECCV 2024*

- 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. in Business Administration and Cognitive Science *Seoul, South Korea*

Work Experience

Plask *2021.3 – 2021.8*

Machine Learning Engineer

- Worked as a machine learning engineer at an AI startup developing a 3D pose estimation service and improving model performance.

Hyundai Mobis *2019.9 – 2020.2*

Intership in Data Science Team

- Worked as an intern in the Data Science team at Hyundai Mobis, where I focused on data analysis using factory data.

Industrial Projects

ETRI (Electronics and Telecommunications Research Institute) *2023.01 - 2024.06*

Academic-Research Cooperation

- Researched Deformable 3D Gaussian Splatting introducing per-Gaussian embedding based deformation.
  Also, researched Dynamic NeRFs for unsynchronized multi-view videos.

LG Display *2022.2 - 2022.12*

Academic-Industrial Cooperation

- Researched Knowledge Distillation methods for binary and multi-class classification of panel data.
  Proposed a method of distilling similarity between patch-level feature maps, for fine-grained classification of panel defects.

Korean Patents

10-2024-0043684	Method and apparatus for Dynamic Gaussian Splatting using embedding-based deformation	*2024*
10-2023-0105173	Method and apparatus for representing dynamic neural radiance fields from unsynchronized videos	*2023*
10-2020-0022362	Apparatus of diagnosing noise quality of motor	*2020*

Awards History

AID Korea	**1st place Minister's Award** Animal Datathon Korea	*2021*
Kaggle	**Top 2% Silver Medal** Cassava Leaf Disease Classification	*2021*
SNU Hospital	**5th place** Sleep AI Challenge	*2021*