BIDIRECTIONAL FLOW FIELDS FOR SPARSE INPUT NOVEL VIEW SYNTHESIS OF DYNAMIC SCENES

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Index Terms— Dynamic novel view synthesis, motion modeling, dynamic radiance fields, volume rendering

1. VIDEO COMPARISONS

We provide the side-by-side video comparisons in three sets as

- **Baseline Comparison:** We compare our model (BF-DeRF) with 4DGS [1], STGS [2], and RF-DeRF [3] across different datasets

- **Impact of Initialization and Hyperparameters:** We present comparison videos on how initialization and hyperparameter sensitivity affect Gaussian splatting models. We observe that Gaussian splatting models suffer from poor initialization in case of sparse input views, as shown in the video comparisons HTML file under *Impact of Initialization and Hyperparameters* section. 4DGS model fails to obtain the finer details on the objects.

  STGS, in particular, having the ability to change the color and opacity of the Gaussians over time and views, increases the model capacity, which leads to the model being sensitive to hyperparameters. Illustrated examples in the supplement show the rendered videos of different color grading, and there is close to no information learned about the scene in the rendered novel view in the case of 2 input training views.

- **Scene flow visualization results:** We showcase the scene flow visualization results obtained by our model.

To facilitate easy viewing of various comparisons, we include a simple HTML file (with anonymity preserved) alongside this supplementary material. This file embeds video comparisons along with their corresponding explanations. Additionally, the videos are available separately for viewers or reviewers who prefer not to use the HTML file The videos are encoded using H.264 codec with yuv420p as the pixel format and at a frame rate of 30fps.

2. REFERENCES

[1] Guanjun Wu, Taoran Yi, Jiemin Fang, Lingxi Xie, Xiaopeng Zhang, Wei Wei, Wenyu Liu, Qi Tian, and Wang Xinggang, "4D gaussian splatting for real-time dynamic scene rendering," *arXiv e-prints*, p. arXiv:2310.08528, 2023.

[2] Zhan Li, Zhang Chen, Zhong Li, and Yi Xu, "Spacetime gaussian feature splatting for real-time dynamic view synthesis," 2024.

[3] Nagabhushan Somraj, Kapil Choudhary, Sai Harsha Mupparaju, and Rajiv Soundararajan, "Factorized motion fields for fast sparse input dynamic view synthesis," in *Proceedings of the ACM Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH)*, 2024.