ADC-GS: Anchor-Driven Deformable and Compressed Gaussian Splatting for Dynamic Scene Reconstruction

Current Research

Motivation:

1. Gaussian features in 4DGS has local similarity.

2. Current 4DGS methods focus on per-Gaussian deformation, neglecting the redundancy of adjacent Gaussians.

The limitations result in high storage and suboptimal rendering speed in 4DGS.

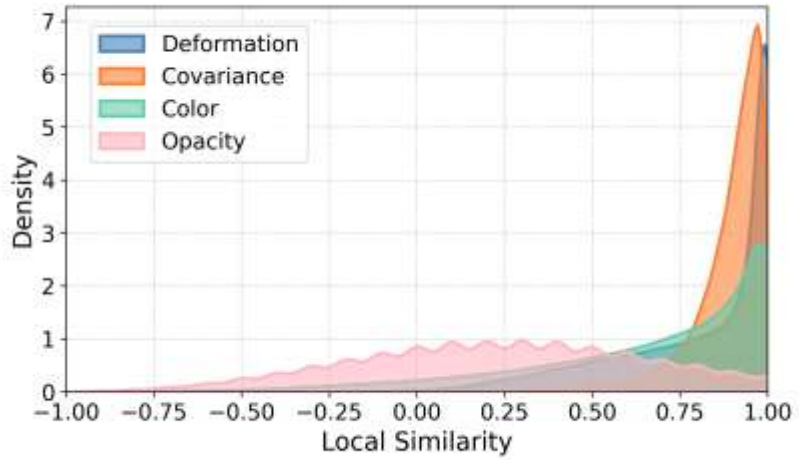


Illustration of local similarities of different features in 4DGS.

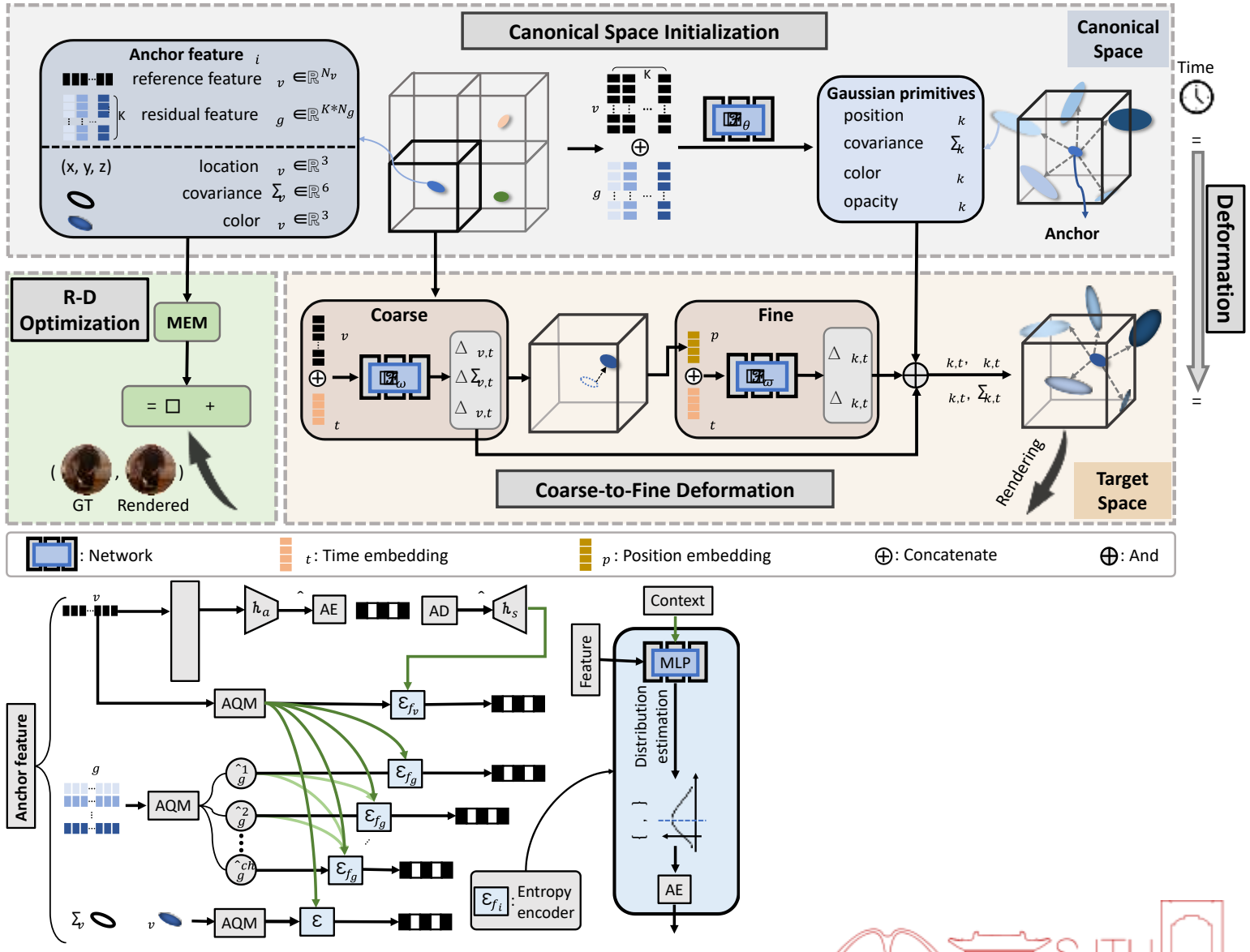
Methods

Method Overview:

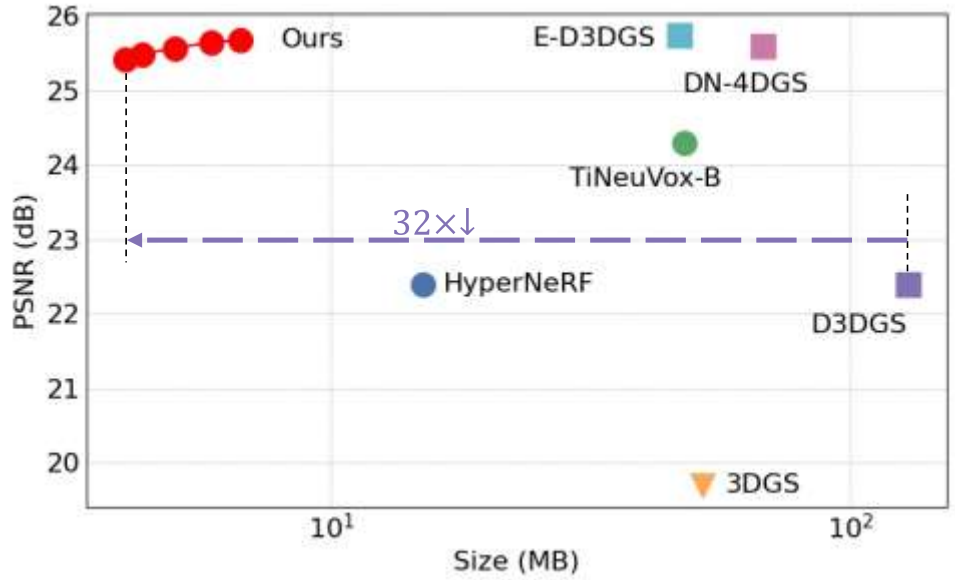
- Anchor-based compact organization of Gaussian primitives
- Coarse-to-fine anchor-driven deformation
- Rate–distortion optimization

Advantages:

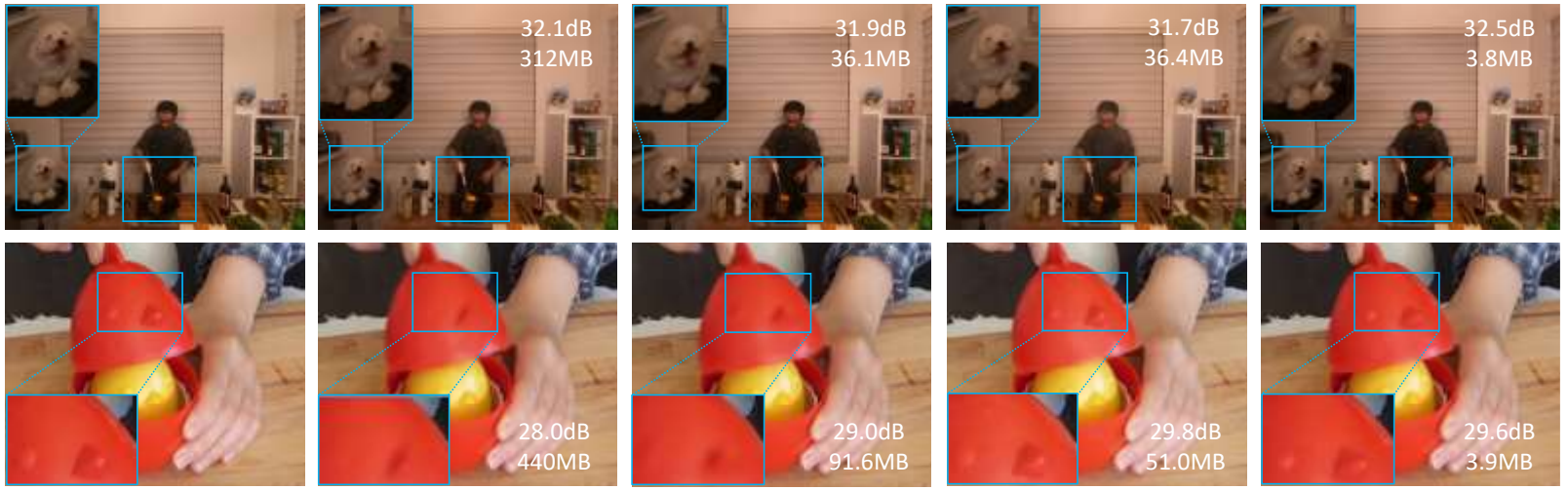
- Low memory overhead
- Fast rendering speed
- Fine-grained detail preservation
- High rendering quality



Results



Model	PSNR↑	SSIM↑	LPIPS↓	FPS↑	Size (MB)↓
Nerfies	22.20	0.803	0.170	< 1	-
HyperNeRF	22.40	0.814	0.153	< 1	15
TiNeuVox-B	24.30	0.836	0.393	1	48
3DGS	19.70	0.680	0.383	55	52
D3DGS	22.40	0.612	0.275	22	129
DN-4DGS	25.59	0.861	-	20	68
4DGaussian	25.60	0.848	0.281	22	63
E-D3DGS	25.74	0.697	0.231	26	47
Ours	25.42	0.777	0.315	135	4.02
	25.53	0.791	0.278	117	5.20
	25.68	0.825	0.252	101	6.67



ADC-GS achieves optimal storage efficiency and rendering speed while maintaining high reconstruction quality.

Thanks

Github: https://github.com/H-Huang774/ADC-GS

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