



4D Gaussian Splatting for Real-Time Dynamic Scene Rendering

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What can 4D-GS do?

1. 4D-GS achieves real-time rendering on dynamic scenes.

Complete the training within **30 minutes**.

Render at a speed exceeding **30 FPS**.

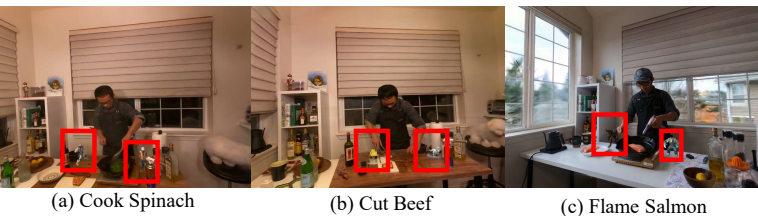
Minimize storage overhead to at least **20 MB**.



2. Tracking Object's motion by proposed Gaussian Deformation Field Network

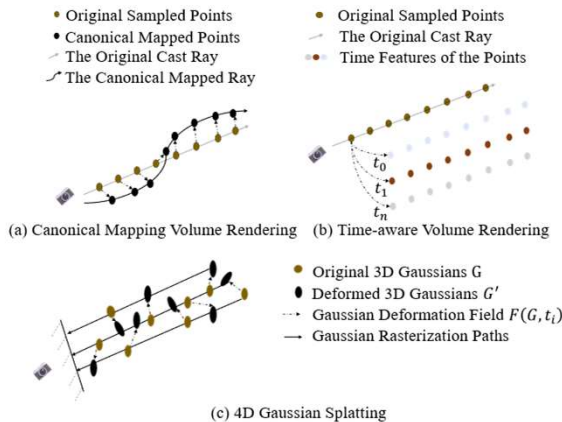


3. Composition with any 4D Gaussians for editing.



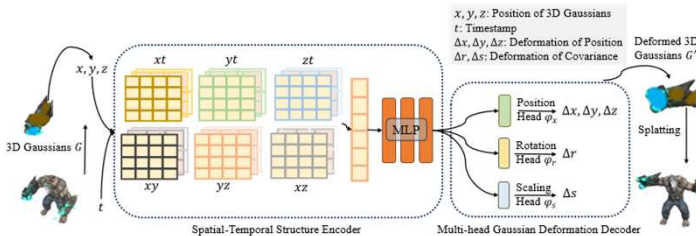
4D Gaussian Splatting Framework

Computing the **canonical-to-world mapping** by a Gaussian deformation field network.



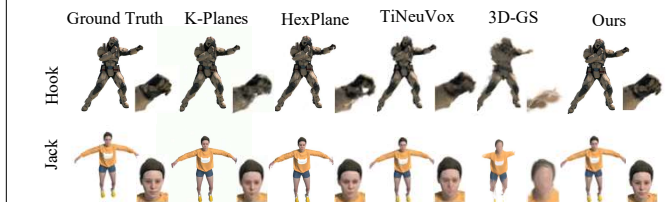
Gaussian Deformation Field Network

Spatial-Temporal encoder is proposed to connect each 3D Gaussians. Multi-head Gaussian deformation decoder is applied to compute 3D Gaussians' deformation.

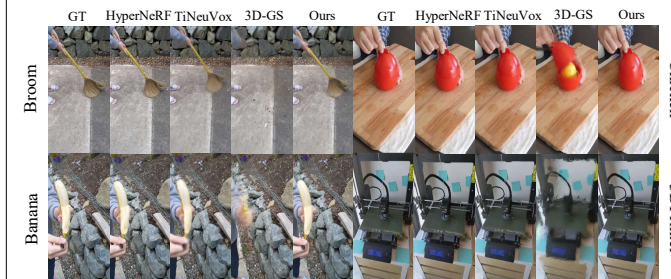


Results

Our methods achieves state-of-the-art performance across the current methods.



Model	PSNR(dB)↑	SSIM↑	LPIPS↓	Time↓	FPS ↑	Storage (MB)↓
TiNeuVox-B [8]	32.67	0.97	0.04	28 mins	1.5	48
KPlanes [11]	31.61	0.97	-	52 mins	0.97	418
HexPlane-Slim [5]	31.04	0.97	0.04	11m 30s	2.5	38
3D-GS [21]	23.19	0.93	0.08	10 mins	170	10
FFDNeRF [18]	32.68	0.97	0.04	-	< 1	440
MSTH [52]	31.34	0.98	0.02	6 mins	-	-
V4D [12]	33.72	0.98	0.02	6.9 hours	2.08	377
Ours	34.05	0.98	0.02	8 mins	82	18



Acknowledgments

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