

FACT-GS: Frequency-Aligned Complexity-Aware Texture Reparameterization for 2D Gaussian Splatting

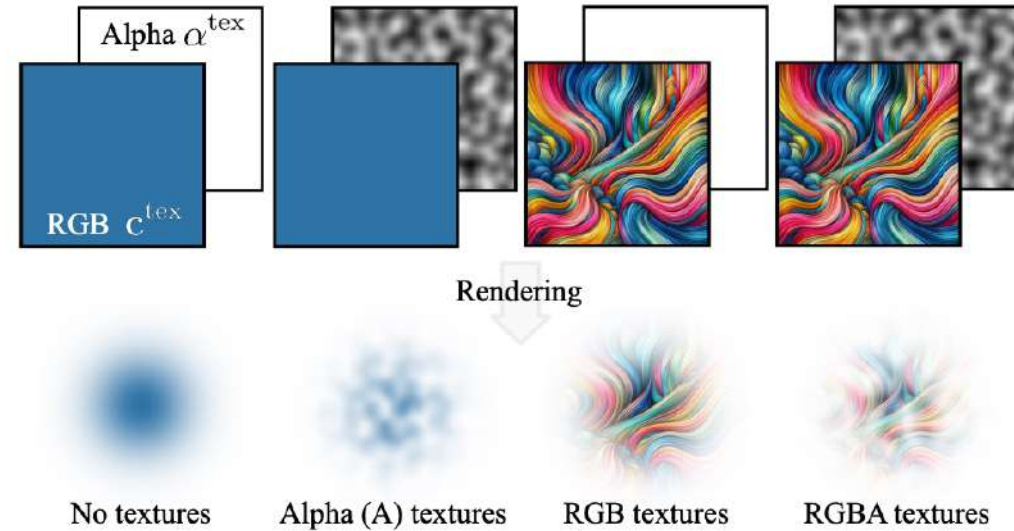
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Preliminary



[1] 3D Gaussian Splatting



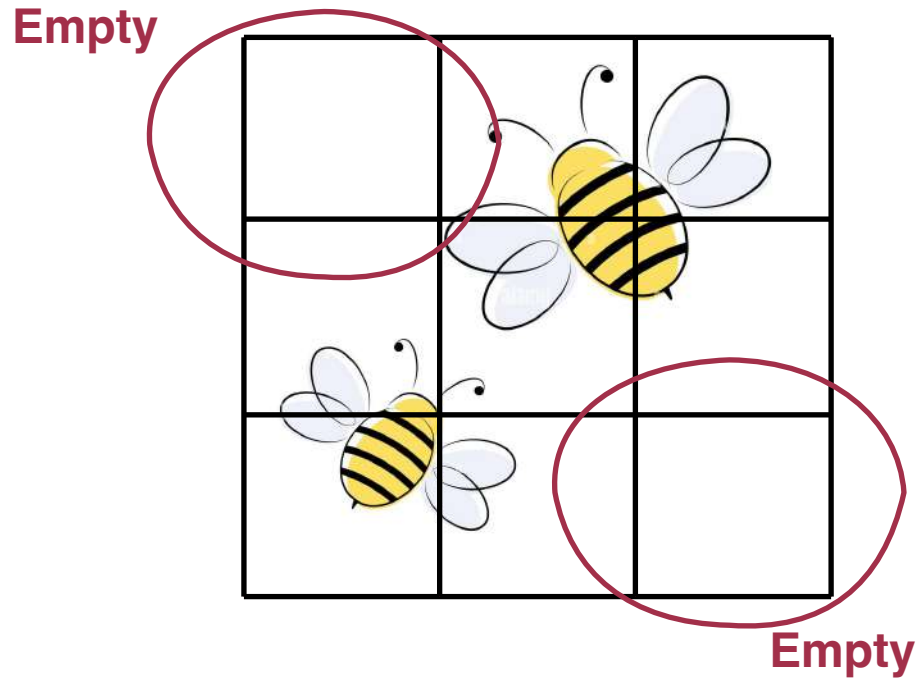
[2] Textured GS

[1] Kerbl, Bernhard, et al. "3D Gaussian Splatting for Real-Time Radiance Field Rendering." *ACM Trans. Graph.* 42.4 (2023): 139-1.

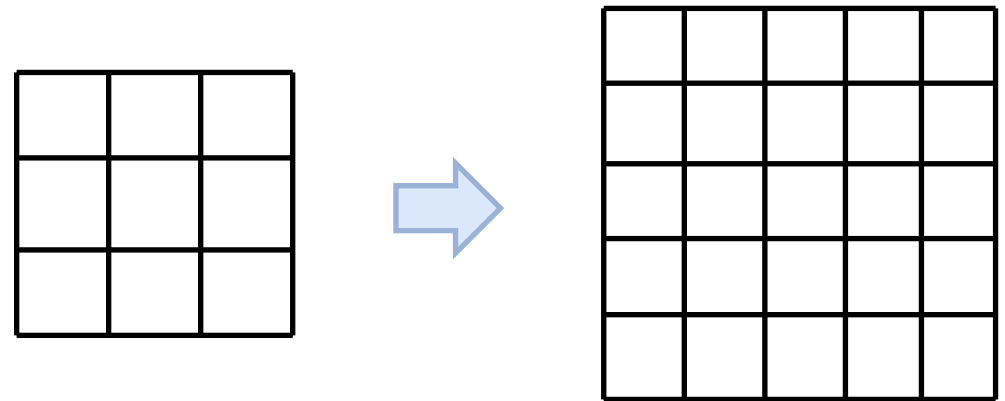
[2] Chao, Brian, et al. "Textured gaussians for enhanced 3d scene appearance modeling." *Proceedings of the Computer Vision and Pattern Recognition Conference.* 2025.

Motivation

✗ Inefficient texture space utilization



✗ Inefficient texture resolution scaling

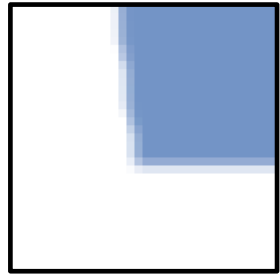


2.25x parameters

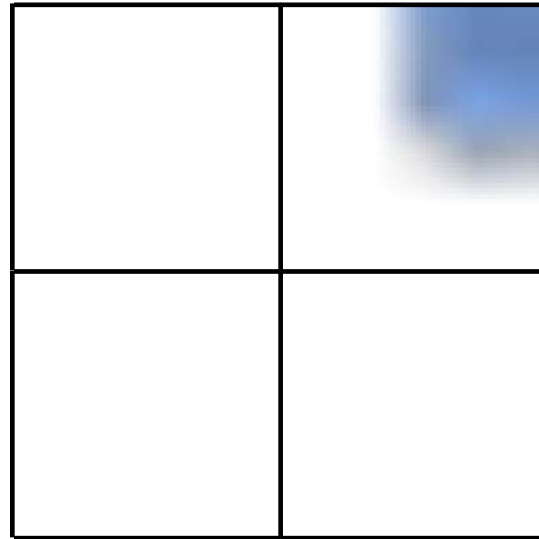
Method

$$c(u, v) = \text{bilerp}(u, v, T)$$

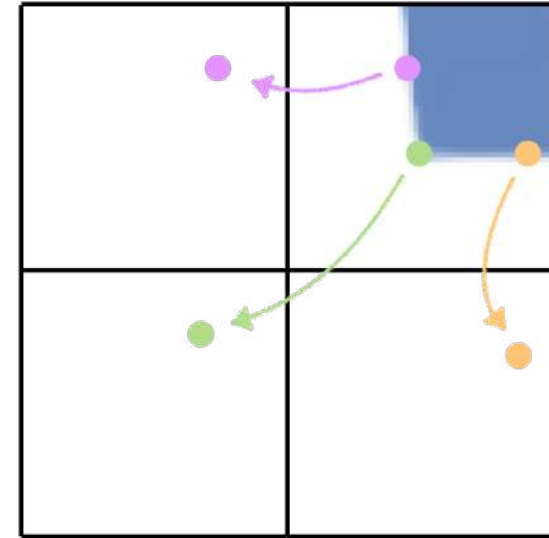
$$(u', v') = \phi(u, v) = (u + du, v + dv)$$
$$c(u, v) = \text{bilerp}(u', v', T)$$



GT

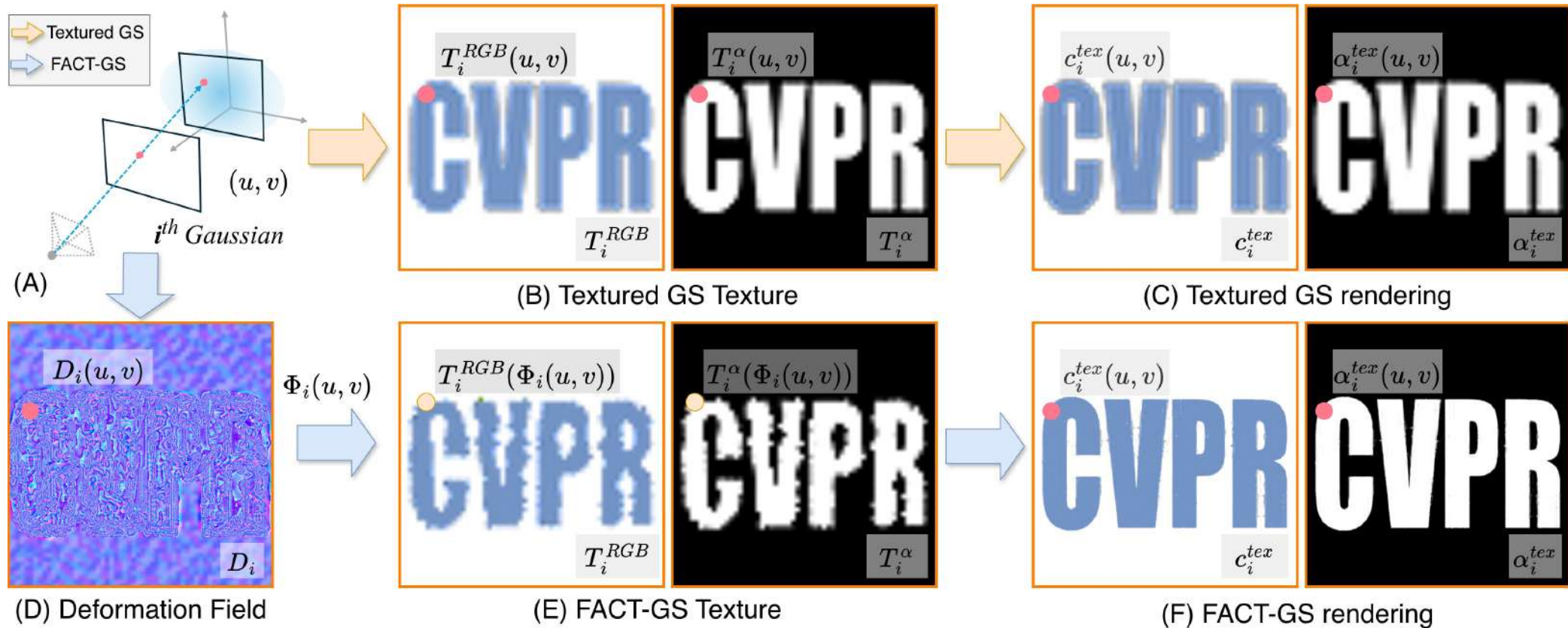


Regular grid



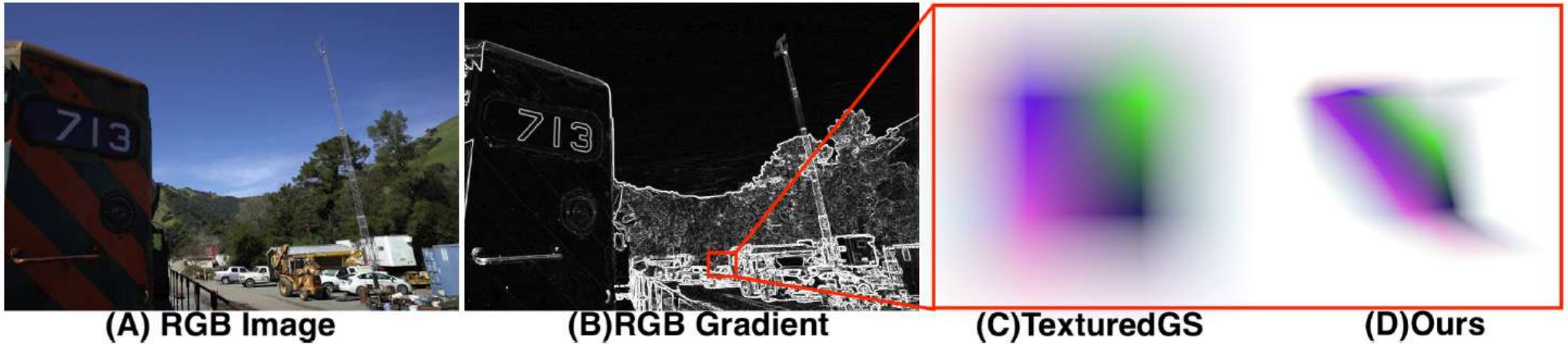
Ours

Method

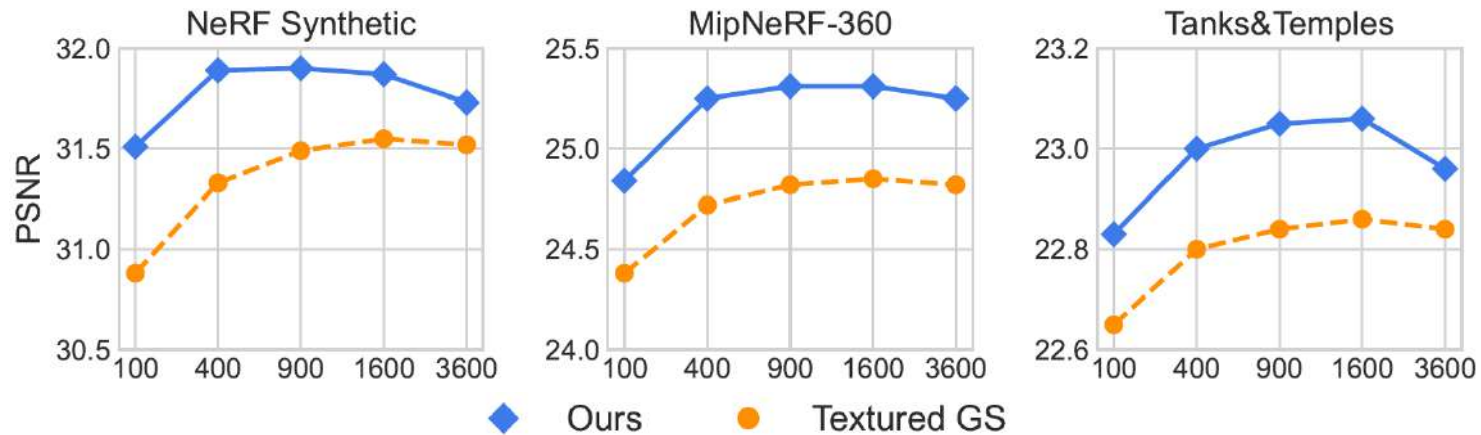


Experiments

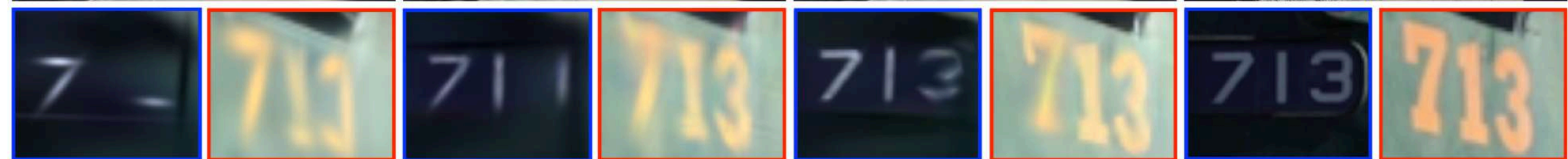
✓ Better High-frequency Response



✓ More Efficient Memory Usage



Same performance with only $\frac{1}{16}$ texture parameters.



2DGS

Textured GS

Ours

Ground Truth

OPENTOWORK!

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