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Large Scene Rendering

- Large-Scene Rendering is hard due to scale and complexity
- Existing methods:
- Neural rendering mainly works on small scenes Graphics approaches lack realism
- NeuRas: Combines neural texture representation and rasterization
- NeuRas realistically renders large scenes at 1920 × 1080 @ 100hz



Results On Urban Driving Scenes & Drone Scenes



Real-Time Neural Rasterization for Large Scenes

Jeffrey Liu, Yun Chen*, Ze Yang*, Jingkang Wang, Sivabalan Manivasagam, Raquel Urtasun https://waabi.ai/NeuRas/

Approach: Neural Rasterization

- Scene is represented as meshes and skyboxes with neural texture features
- Use OpenGL to rasterize screen-space feature buffers from the scene representation
- Multi-layers are composited to synthesize final output



Geometry





Feature buffer

• MLP predicts the color from the feature and view direction. MLP is baked as a shader during inference

Rendered Layers

Speedup NeRFs



Speed-Realism Trade-off

Our method achieves the best tradeoff between realism and speed. The size of the markers indicates the memory consumption required for rendering





Final Image

Ablations

NeuRas performs well on coarser mesh







Ours with mesh-500K (PSNR: 26.65)

MLP shader improves realism

Methods	PSNR ↑	SSIM ↑	LPIPS↓
No MLP	24.48	0.664	0.374
MLP-shader w/o viewdir	25.01	0.728	0.316
MLP shader	25.34	0.738	0.308