Supplemenatary Material: Plenoptic PNG: Real-Time Neural Radiance Fields in 150 KB

We provide additional training details, quantitative and qualitative results in the appendix. We also invite the reviewers to watch our supplementary video and to play with our web demo.

1. Training Details

We follow default parameters of Instant-NGP [4] for training. Specifically we minimize the Huber Loss with 50,000 steps using Adam [3] optimizer. During training our voxel-based density grid cache has resolution of 128. For object level scenes, we use single scale voxel grid. For unbounded scenes, we use voxel grids with five scales, where higher scale covers half of each dimension (i.e, 0.5 width, 0.5 height and 0.5 depth) with the same resolution centered at (0.5, 0.5, 0.5).

2. Additional Qualitative Results

We provide additional qualitative results for all the datasets.

3. Additional Quantiative Results

Comparisons with real-time methods. We provide a quantitative comparison with real-time Web-compatible methods in Table 1. This table shows that our approach benefits from a small model size, fast training speed, minimal VRAM requirements, and real-time rendering capabilities, while maintaining comparable rendering quality.

Detailed quantitative performance per scene. We show detailed quantitative results of our PPNG model across the NeRF Synthetics, NSVF Synthetic, BlendedMVS, and Tanks and Temples datasets from Table 6. to Table 15.

Table 1. Comparison with the real-time WebGL rendered models. We use values provided from [5] for SNeRG [2], MobileNeRF [1], Re-Rend [5], and author provided values for PlenOctree [6]

Model Name	PSNR	Size	GPU Usage	Training Time
SNeRG [2]	30.4	87 MB	3627 MB	15 hrs
MobileNeRF [1]	30.9	126 MB	570 MB	20 hrs
PlenOctree [6]	31.7	1976 MB	1690 MB	50 hrs
Re-Rend [5]	29.0	199 MB	532 MB	60 hrs
PPNG-1	28.8	151 KB	47 MB	13.1 min
PPNG-2	31.0	2.49 MB	47 MB	9.8 min
PPNG-3	31.5	32.8 MB	47 MB	4.9 min

Table 2. PSNR evaluation for for Tanks and Temples dataset.

	Barn	Caterpillar	Family	Ignatius	Truck
PPNG-1	24.52	22.78	29.97	26.71	24.42
PPNG-2	25.71	24.32	32.50	27.16	26.46
PPNG-3	26.42	24.88	33.28	27.51	27.05

Table 3. SSIM evaluation for for Tanks and Temples dataset.

	Barn	Caterpillar	Family	Ignatius	Truck
PPNG-1	0.827	0.882	0.937	0.937	0.881
PPNG-2	0.848	0.900	0.958	0.943	0.910
PPNG-3	0.869	0.915	0.968	0.951	0.923

Table 4. LPIPS (AlexNet) evaluation for for Tanks and Temples dataset.

	Barn	Caterpillar	Family	Ignatius	Truck
PPNG-1	0.327	0.200	0.085	0.086	0.197
PPNG-2	0.274	0.152	0.046	0.077	0.132
PPNG-3	0.208	0.131	0.036	0.072	0.112

Table 5. PSNR evaluation for for BlendedMVS dataset.

	Character	Fountain	Jade	Statues
PPNG-1	25.4	24.14	24.87	24.67
PPNG-2	28.88	26.07	25.14	26.04
PPNG-3	29.65	26.52	24.91	26.48

Table 6. SSIM evaluation for for BlendedMVS dataset.

	Character	Fountain	Jade	Statues
PPNG-1	0.911	0.823	0.849	0.838
PPNG-2	0.956	0.881	0.861	0.879
PPNG-3	0.965	0.901	0.870	0.900

Table 7. LPIPS (AlexNet) evaluation for for BlendedMVS dataset.

	Character	Fountain	Jade	Statues
PPNG-1	0.076	0.18	0.128	0.152
PPNG-2	0.029	0.095	0.102	0.092
PPNG-3	0.023	0.078	0.096	0.073

Table 8. PSNR evaluation for NeRF synthetic dataset.

	chair	drums	ficus	hotdog	lego	materials	mic	ship
PPNG-1	29.69	23.14	28.2	33.82	30.39	26.89	32.08	26.9
PPNG-2	32.5	25.07	31.04	35.22	33.37	27.5	34.11	29.13
PPNG-3	33.54	25.41	31.6	36.17	34.54	28.53	35.18	30.27

Table 9. SSIM evaluation for for NeRF synthetic dataset.

	chair	drums	ficus	hotdog	lego	materials	mic	ship
PPNG-1	0.94	0.904	0.937	0.966	0.937	0.918	0.969	0.84
PPNG-2	0.968	0.919	0.96	0.975	0.967	0.915	0.978	0.869
PPNG-3	0.973	0.915	0.964	0.978	0.974	0.926	0.979	0.884

Table 10. LPIPS (AlexNet) evaluation for for NeRF synthetic dataset.

	chair	drums	ficus	hotdog	lego	materials	mic	ship
PPNG-1	0.056	0.116	0.046	0.041	0.04	0.09	0.044	0.207
PPNG-2	0.022	0.077	0.034	0.028	0.018	0.094	0.027	0.135
PPNG-3	0.015	0.075	0.031	0.022	0.014	0.072	0.021	0.1

Table 11. PSNR evaluation for Synthetic NSVF dataset.

	Bike	Lifestyle	Palace	Robot	Spaceship	Steamtrain	Toad	Wineholder
PPNG-1	26.42	28.07	31.85	30.87	29.89	30.89	25.99	26.42
PPNG-2	34.71	30.74	34.42	34.61	30.54	33.21	32.65	28.83
PPNG-3	35.64	31.43	36.27	35.5	31.0	33.92	34.15	29.7

Table 12. SSIM evaluation for for Synthetic NSVF dataset.

	Bike	Lifestyle	Palace	Robot	Spaceship	Steamtrain	Toad	Wineholder
PPNG-1	0.955	0.927	0.934	0.973	0.966	0.971	0.89	0.927
PPNG-2	0.984	0.946	0.962	0.987	0.966	0.98	0.966	0.951
PPNG-3	0.987	0.954	0.975	0.989	0.967	0.984	0.977	0.96

Table 13. LPIPS (AlexNet) evaluation for for Synthetic NSVF dataset.

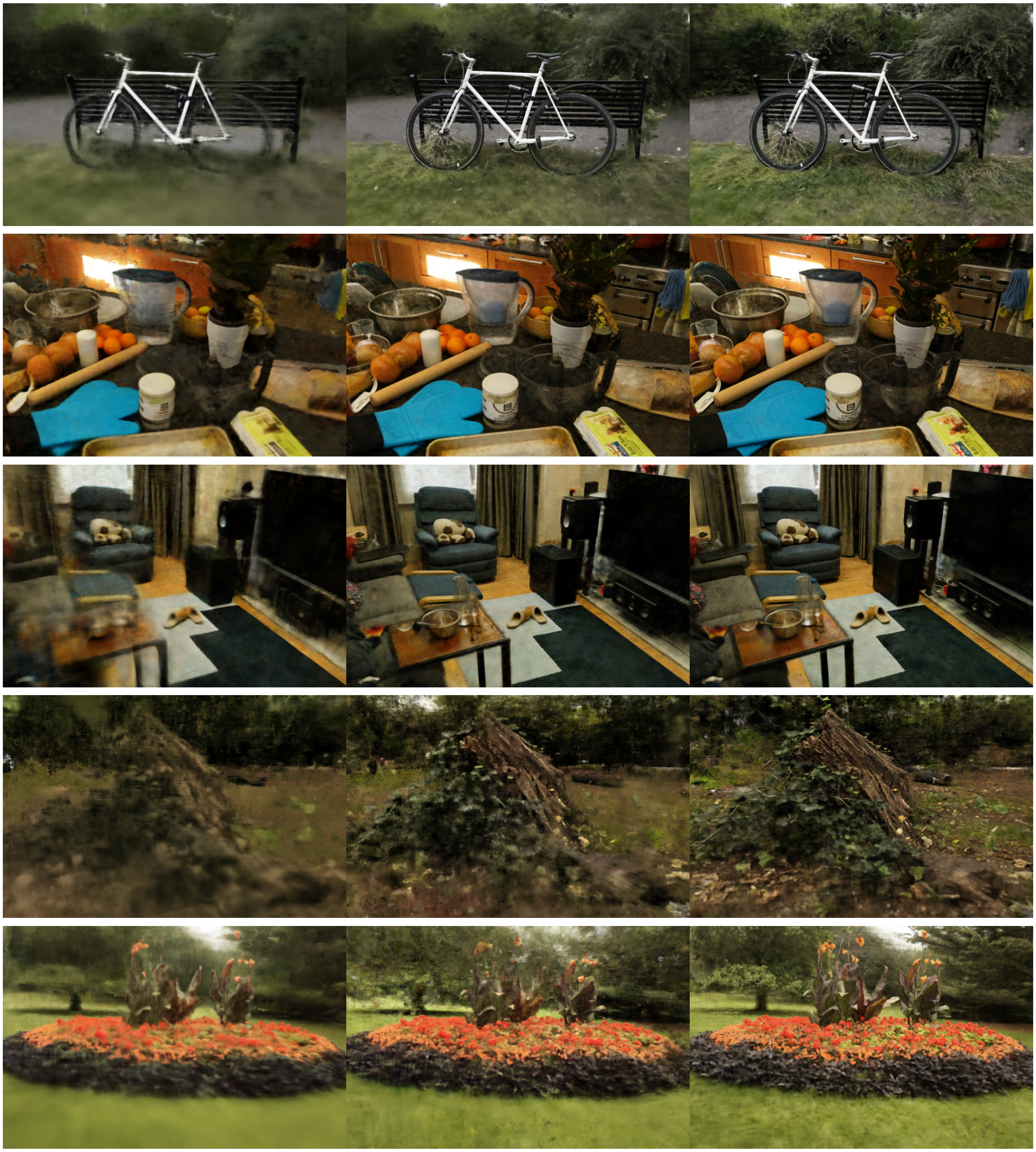
	Bike	Lifestyle	Palace	Robot	Spaceship	Steamtrain	Toad	Wineholder
PPNG-1	0.028	0.072	0.044	0.023	0.037	0.027	0.09	0.063
PPNG-2	0.008	0.046	0.02	0.009	0.038	0.017	0.025	0.035
PPNG-3	0.006	0.038	0.012	0.008	0.037	0.015	0.015	0.027

PPNG-1 PPNG-2 PPNG-3

Figure 1. Qualitative results for Blended MVS dataset.

Figure 2. Qualitative results for Synthetic NSVF dataset

Figure 3. Qualitative results for Tanks and Temples dataset



PPNG-1 PPNG-2 PPNG-3

Figure 4. Qualitative results for unboudned 360° dataset.

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