TODO

1. Check evaluation metrics of c3dgs
2. Corporate view-dependent color to our code

Evaluation Metrics of c3dgs

- Mip-nerf 360

Scene		bicycle	flowers	garden	stump	tree hill	room	counter	kitchen	bonsai	Avg.
3DGS	PSNR	25.10	21.33	27.25	26.66	22.53	31.50	29.11	31.53	32.16	27.46
	SSIM	0.747	0.588	0.856	0.769	0.635	0.925	0.914	0.932	0.946	0.812
	LPIPS	0.244	0.361	0.122	0.243	0.346	0.198	0.184	0.117	0.181	0.222
	Train (mm:ss)	34:04	25:33	33:46	27:05	24:51	22:55	22:42	26:08	19:18	24:07
	#Gaussians	5,723,640	3,414,994	5,641,235	4,549,202	3,470,681	1,483,653	1,171,684	1,744,761	1,250,329	3,161,131
	Storage (MB)	1350.78	805.94	1331.33	1073.60	819.08	350.14	276.52	411.76	295.08	746.03
	FPS	63.81	132.03	77.19	108.81	100.92	132.51	146.40	122.07	199.86	120.40
Ours	PSNR	24.77	20.89	26.81	26.46	22.65	30.88	28.71	30.48	32.08	27.08
	SSIM	0.723	0.556	0.832	0.757	0.638	0.919	0.902	0.919	0.939	0.798
	LPIPS	0.286	0.399	0.161	0.278	0.363	0.209	0.205	0.131	0.193	0.247
	Train (mm:ss)	42:36	32:37	45:36	33:43	34:08	24:18	27:41	32:59	24:16	33:06
	#Gaussians	2,221,689	1,525,598	2,209,609	1,732,089	2,006,446	529,136	536,672	1,131,168	601,048	1,388,162
	Storage (MB)	62.99	51.15	62.78	54.66	59.33	34.21	34.34	44.45	35.44	**48.82**
	FPS	76.41	142.41	89.49	120.96	110.28	183.03	119.52	114.24	196.08	**128.05**
Ours+PP	PSNR	24.73	20.89	26.72	26.31	22.67	30.88	28.63	30.48	31.98	27.03
	SSIM	0.722	0.554	0.831	0.754	0.637	0.918	0.901	0.919	0.937	0.797
	LPIPS	0.284	0.399	0.158	0.280	0.363	0.209	0.206	0.130	0.193	0.247
	Storage (MB)	42.42	32.05	43.26	33.83	39.08	15.01	15.22	24.39	16.40	**29.07**

Table 9. Per-scene results evaluated on Mip-NeRF 360 dataset.

- T&T and Deep Blending

Dataset		Tanks&Temples			Deep Blending		
Scene		train	truck	Avg.	drjohnson	playroom	Avg.
3DGS	PSNR	22.07	25.35	23.71	29.06	29.87	29.46
	SSIM	0.812	0.878	0.845	0.899	0.901	0.900
	LPIPS	0.208	0.148	0.178	0.247	0.247	0.247
	Train (mm:ss)	12:18	15:24	13:51	24:22	19:22	21:52
	#Gaussians	1,084,001	2,579,252	1,831,627	3,278,027	2,343,368	2,810,698
	Storage (MB)	255.82	608.70	432.26	773.61	553.03	663.32
	FPS	174.42	145.14	159.78	110.46	154.47	132.47
Ours	PSNR	21.56	25.07	23.32	29.26	30.32	**29.79**
	SSIM	0.792	0.871	0.831	0.900	0.902	0.901
	LPIPS	0.240	0.163	0.201	0.258	0.258	0.258
	Train (mm:ss)	16:03	20:36	18:20	30:31	24:35	27:33
	#Gaussians	710,434	962,158	836,296	1,339,005	778,353	1,058,679
	Storage (MB)	37.29	41.57	**39.43**	47.98	38.45	**43.21**
	FPS	185.91	184.83	**185.37**	155.37	205.83	**180.60**
Ours+PP	PSNR	21.62	25.02	23.32	29.16	30.30	**29.73**
	SSIM	0.792	0.870	0.831	0.899	0.900	0.900
	LPIPS	0.240	0.163	0.202	0.257	0.259	0.258
	Storage (MB)	19.07	22.64	**20.86**	28.43	19.21	**23.82**

Table 10. Per-scene results evaluated on Tank&Temples and Deep Blending.

- Compression rate:
  - c3dgs: around 90%
  - c3dgs + post-processing: around 96%

- post-processing:
    1. Applying 8-bit min-max quantization to opacity and hash grid parameters.
    2. Pruning hash grid parameters with values below 0.1.
    3. Applying Huffman encoding on the quantized opacity and hash parameters, and R-VQ indices.