

## Appendix

## I SSIM and LPIPS of 9 models on 16 types of vegetations

As shown in Table 1 and Table 2, our method can achieve optimal or suboptimal SSIM and LPIPS values on most vegetation datasets, with average SSIM and LPIPS values of 0.872 and 0.163, respectively, second only to BBSplat and 3DGS in the rendering-oriented radiance field method, and at the highest level in the reconstruction-oriented radiance fields.

Table 1 : SSIM ( $\uparrow$ ) of 9 models on 16 types of vegetations

Vegetation	INGP	3DGS	BBSplat	R-3DGS	Neus2	2DGS	Sugar	G-surfels	ours
Virtual Pine	0.917	0.946	0.957	0.935	0.897	0.933	0.926	0.930	0.949
Virtual Plam	0.855	0.875	0.901	0.869	0.858	0.876	0.886	0.893	0.902
Virtual Withered	0.893	0.935	0.932	0.927	0.886	0.919	0.907	0.911	0.936
Virtual Pear	0.885	0.920	0.899	0.903	0.897	0.900	0.851	0.892	0.894
Virtual Ulmus	0.852	0.883	0.917	0.876	0.849	0.877	0.861	0.869	0.917
Virtual Pear	0.941	0.960	0.964	0.957	0.939	0.958	0.942	0.962	0.963
Virtual Cucumber	0.913	0.958	0.962	0.949	0.899	0.927	0.919	0.957	0.959
Virtual Aloe	0.963	0.972	0.968	0.969	0.965	0.968	0.964	0.970	0.967
Withered	0.784	0.812	0.859	0.721	0.689	0.732	0.798	0.814	0.843
Locust	0.753	0.803	0.847	0.698	0.671	0.714	0.782	0.769	0.829
Crape Myrtle	0.769	0.851	0.822	0.831	0.683	0.726	0.791	0.837	0.804
Pine	0.718	0.715	0.719	0.689	0.671	0.698	0.709	0.706	0.712
Maple	0.721	0.712	0.723	0.692	0.674	0.701	0.705	0.706	0.718
Euo Jap	0.771	0.853	0.828	0.715	0.688	0.729	0.793	0.839	0.815
Shurb	0.841	0.883	0.891	0.879	0.769	0.812	0.856	0.874	0.876
Potting	0.832	0.861	0.879	0.789	0.758	0.801	0.847	0.859	0.871
Mean	0.838	0.871	0.879	0.837	0.799	0.830	0.846	0.862	0.872

Table 2 : LPIPS ( $\downarrow$ ) of 9 models on 16 types of vegetations

Vegetation	INGP	3DGS	BBSplat	R-3DGS	Neus2	2DGS	Sugar	G-surfels	ours
Virtual Pine	0.051	0.049	0.040	0.057	0.052	0.051	0.063	0.054	0.043
Virtual Plam	0.135	0.118	0.098	0.121	0.143	0.122	0.119	0.104	0.115
Virtual Withered	0.075	0.064	0.068	0.069	0.081	0.072	0.082	0.071	0.065
Virtual Pear	0.102	0.077	0.094	0.081	0.104	0.113	0.086	0.097	0.095
Virtual Ulmus	0.124	0.112	0.089	0.117	0.127	0.113	0.136	0.109	0.111
Virtual Sunflower	0.031	0.025	0.024	0.026	0.033	0.028	0.041	0.027	0.028
Virtual Cucumber	0.045	0.034	0.037	0.042	0.051	0.036	0.055	0.033	0.032
Virtual Aloe	0.024	0.019	0.021	0.022	0.026	0.022	0.027	0.023	0.020
Withered	0.314	0.233	0.212	0.241	0.323	0.246	0.301	0.221	0.215
Locust	0.382	0.288	0.295	0.301	0.379	0.291	0.377	0.312	0.297
Crape Myrtle	0.391	0.265	0.277	0.281	0.356	0.299	0.384	0.301	0.279
Pine	0.484	0.336	0.315	0.376	0.491	0.378	0.473	0.335	0.344
Maple	0.474	0.349	0.311	0.361	0.483	0.401	0.464	0.363	0.323
Euo Jap	0.331	0.276	0.268	0.294	0.354	0.371	0.388	0.313	0.273
Shurb	0.292	0.184	0.167	0.191	0.276	0.186	0.211	0.201	0.199
Potting	0.304	0.163	0.181	0.214	0.311	0.210	0.275	0.204	0.175
Mean	0.222	0.162	0.156	0.175	0.224	0.184	0.218	0.173	0.163

II Comparison of Reconstruction Quality of Six Vegetations

