

# Deep Volume Reconstruction from Multi-focus Microscopic Images (Supplementary)

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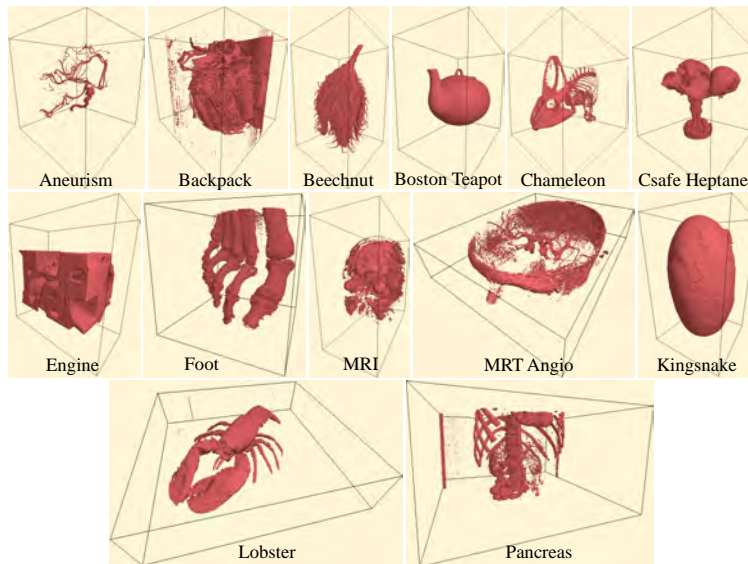
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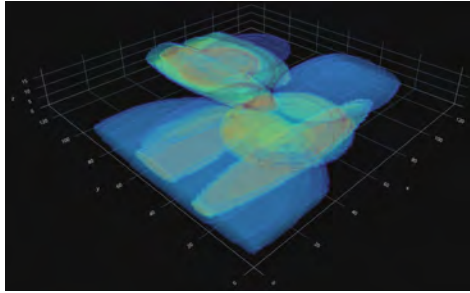
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## 1 Dataset Visualization

Figure 1 shows all the samples used from the Open Scientific Visualization datasets. These samples were chosen due to their varying degrees of complexity and size.



**Fig. 1.** Visualization of samples used for model evaluation before preprocessing, taken directly from [1]. Isovalues are chosen to facilitate visualization. After processing, samples become translucent, according to our pipeline.



**Fig. 2.** Sample from pretraining dataset containing 3D ellipsoids.

## 2 Pretraining Dataset Construction

A single sample of the pretraining dataset is constructed by first sampling a random number of ellipses from 8 to 12, and then placing them randomly on the voxel grid, with axes aligned to the grid for simplicity. The lengths of each of their semi-axes are also randomly sampled from a uniform distribution  $\mathcal{U}(1, 8)$ . Finally, their transmittance values are sampled from  $\mathcal{U}(0.90, 0.95)$ . Ellipsoids that overlap have additively less transmittance in the intersection regions. Figure 2 shows an example generated volume.

## 3 Detailed Results on $50 \times 50$ Images

Sample	Iter		DIP		DIP + Pretr I		DIP + Pretr II	
	PSNR	SSIM	PSNR	SSIM	PSNR	SSIM	PSNR	SSIM
Aneurism	41.93	0.9912	58.15	0.9998	58.70	0.9999	58.49	0.9999
Backpack	43.99	0.9939	48.88	0.9981	49.48	0.9983	49.32	0.9981
Teapot	48.69	0.9984	53.40	0.9996	53.29	0.9996	52.95	0.9996
Chameleon	44.47	0.9938	44.93	0.9949	46.33	0.9963	46.55	0.9966
Engine	35.98	0.9789	49.26	0.9991	48.39	0.9989	49.08	0.9993
Foot	45.73	0.9964	44.61	0.9951	45.08	0.9958	45.02	0.9957
Kingsnake	42.82	0.9908	45.93	0.9938	45.95	0.9944	46.08	0.9941
MRI	38.38	0.9853	42.26	0.9940	41.96	0.9935	43.02	0.9937
MRT angio	47.84	0.9968	47.53	0.9969	47.92	0.9973	48.01	0.9972
Pancreas	47.05	0.9967	48.57	0.9977	47.40	0.9969	48.06	0.9972
Average	43.69	0.9922	48.35	0.9969	48.45	0.9971	<b>48.66</b>	<b>0.9971</b>

**Table 1.** Detailed quantitative results from  $50 \times 50$  images.

## References

1. Klacansky, P.: Open SciVis Datasets (December 2017), <https://klacansky.com/open-scivis-datasets/>, <https://klacansky.com/open-scivis-datasets/>