

Supplementary Materials: Inferring 3D Occupancy Fields through Implicit Reasoning on Silhouette Images

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1 NETWORKS

We leverage the same network introduced in OccNet [1] to learn 3D occupancy fields. The network is a fully-connected neural network with 5 ResNet blocks, the output of OccNet is a value with a range of $[0,1]$ which is produced by a sigmoid function. We train our network with Adam optimizer with an initial learning rate of 0.01. We randomly sample 200 rays from a view, and use 1000 rays in a batch to evaluate a loss.

2 MORE RESULTS

Here, we visualize more shapes reconstructed by the occupancy network trained by our loss for implicit reasoning under three challenging classes including airplanes, chairs, and tables. The shapes are reconstructed under a resolution of $R = 128$.

Besides the reconstructed shapes in our manuscript, we randomly select 200 more shapes that are reconstructed in the test set in each one of the three classes. Specifically, we visualize 200 shapes in a single figure, such that Fig. 1 for airplanes, Fig. 2 for chairs, Fig. 3 for tables, respectively. We

can see that all the reconstructed shapes are with reasonable structures, plausible geometries and arbitrary topologies.

3 SOURCE CODE

We release our demonstration code as a part of supplementary material.

4 OPTIMIZATION VISUALIZATION

We visualize the shape optimization in our video. Specifically, we reconstruct a mesh from the learned occupancy field every 50 iterations, and then render the reconstructed mesh from 4 different views. We stack all rendered images into a video. We can see that our method progressively reveals accurate structures. Please watch our video for more details.

REFERENCES

- [1] Lars Mescheder, Michael Oechsle, Michael Niemeyer, Sebastian Nowozin, and Andreas Geiger. 2019. Occupancy Networks: Learning 3D Reconstruction in Function Space. In *IEEE Conference on Computer Vision and Pattern Recognition*.

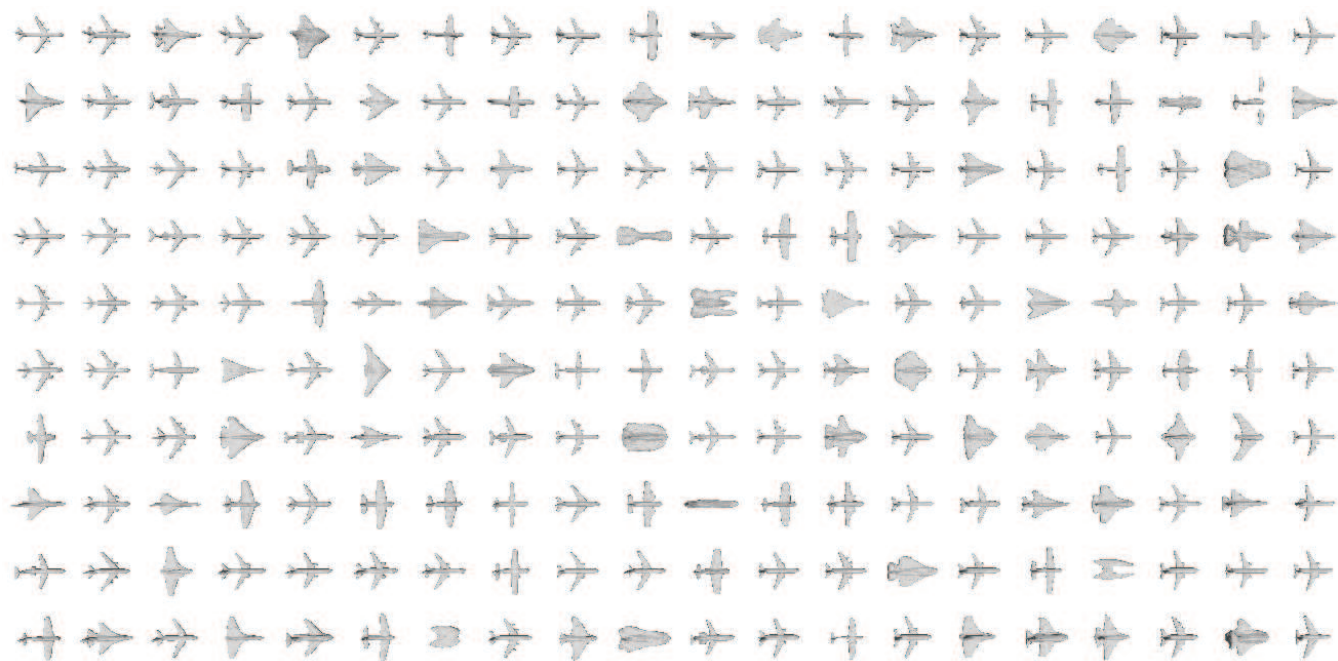


Figure 1: The visualization of 200 airplanes reconstructed by our method.

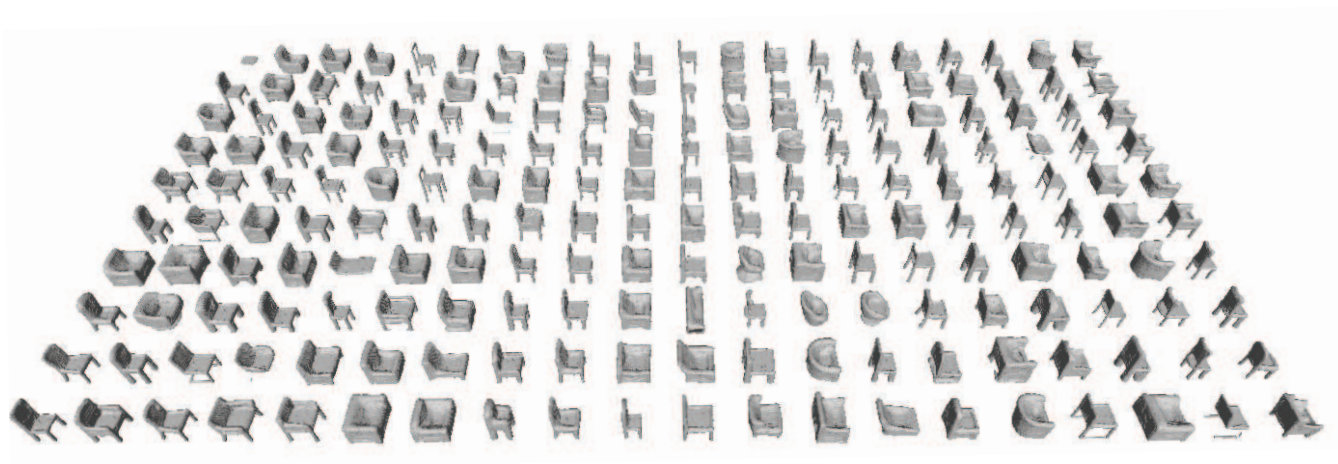


Figure 2: The visualization of 200 chairs reconstructed by our method.

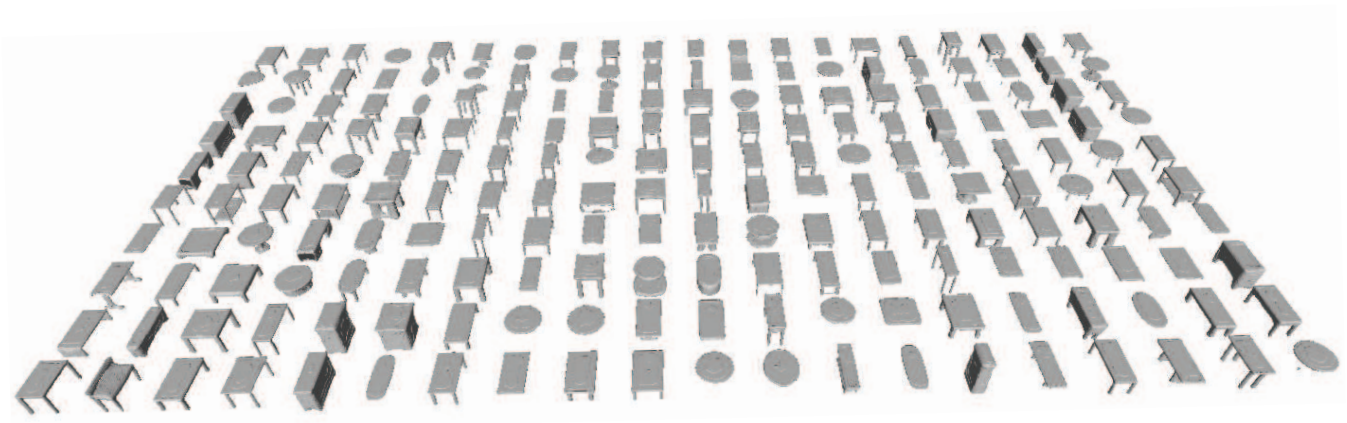


Figure 3: The visualization of 200 tables reconstructed by our method.