Enhancing 2D Representation via Adjacent Views for 3D Shape Retrieval – Supplemental Material

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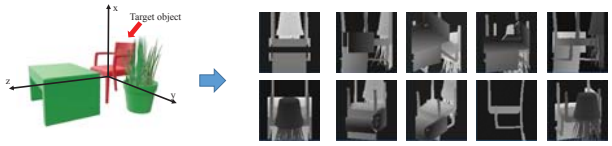

Figure 1. A few examples of our simulated occlusion. For the projection of each target object (color red), two shapes (color green) are randomly selected to conduct occlusion.

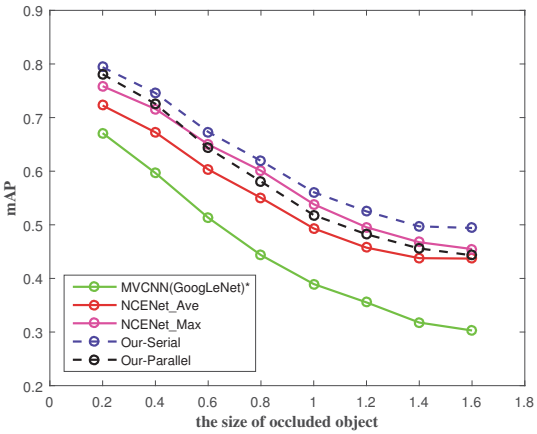

Figure 2. The performance comparison of different sizes of occluded objects on ModelNet40.

1. More Results on Object Occlusion

Considering that objects are often occluded in cluttered 3D scenes, we simulate this occlusion in the OpenGL projection process to evaluate the robust discrimination of our method on ModelNet40. Specifically, during the projection process, two irrelevant shapes are randomly selected and placed around the target object, which is shown in Figure 1. The size of the occluded object ranges from 20% to 160% of the size of the target object.

Figure 2 shows the performance comparison of different methods on simulated occlusion. Note that all approaches are trained with clean images and directly tested with occluded images. We also set a state-of-the-art "MVCNN(GoogLeNet)*" as a baseline method, where GoogLeNet [1] is adopted as the base net and the post-processing metric learning is eliminated to keep fair comparison. As we can see, although the performance of all methods decreases sharply as the size of the occluded object increases, our method still achieves the best retrieval result in the testing even if no occlusion information is added to the training, demonstrating the effectiveness of our correlation unit.

References

[1] Sergey Ioffe and Christian Szegedy. Batch normalization: Accelerating deep network training by reducing internal covariate shift. *arXiv preprint arXiv:1502.03167*, 2015.

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