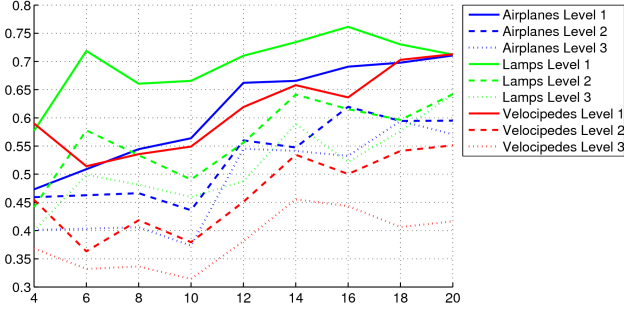


# Co-Hierarchical Analysis of Shape Structures: Supplementary Material

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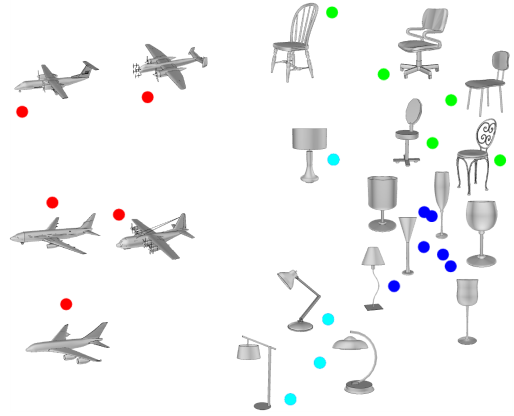
**Figure 1:** Power of larger set: when the size of the analyzed set increases (x axis) the part hit rate (y axis) also increases, especially for higher levels of the co-hierarchy.

## 1 Additional results

**Power of large set.** In Figure 1, we confirm on two sets the hypothesis that the co-analysis benefits from analyzing larger sets of shapes, since then the similarity among the shapes becomes more evident and can be directly inferred. For this experiment, we defined a ground-truth correspondence between the parts of the shapes in each set, in the form of a semantic labeling of the shape parts. We measure for each level of the co-hierarchy how well it reflects the correspondence. Specifically, given a pair of shapes  $M_i$  and  $M_j$  and a node  $N_k$  of the co-hierarchy, we count how many of the parts in  $N_k$  that come from  $M_i$  also have a corresponding part of  $M_j$  in the same node  $N_k$ . We then divide this sum by the total number of parts in  $M_i \cap N_k$ , which gives a *part hit rate*. We compute the average hit rate for all the pairs of shapes in a set and all the nodes in the requested level, which we show in the graph. In these specific examples, we observe an improvement of 10–20% when the full sets are used in the co-analysis. Moreover, we notice that higher levels have higher hit rates, as then the correspondence is more coarse.

**Mixed set.** In Figure 2, we show that the cluster-and-select also has the potential of handling mixed sets composed of more than one category of shapes (chairs + lamps + airplanes + goblets in the example), which is beyond the capability of existing co-segmentation algorithms. We see that chairs and airplanes are well-separated in the embedding and form two different clusters, but there is confusion between lamps and goblets since these two sets are more structurally similar.

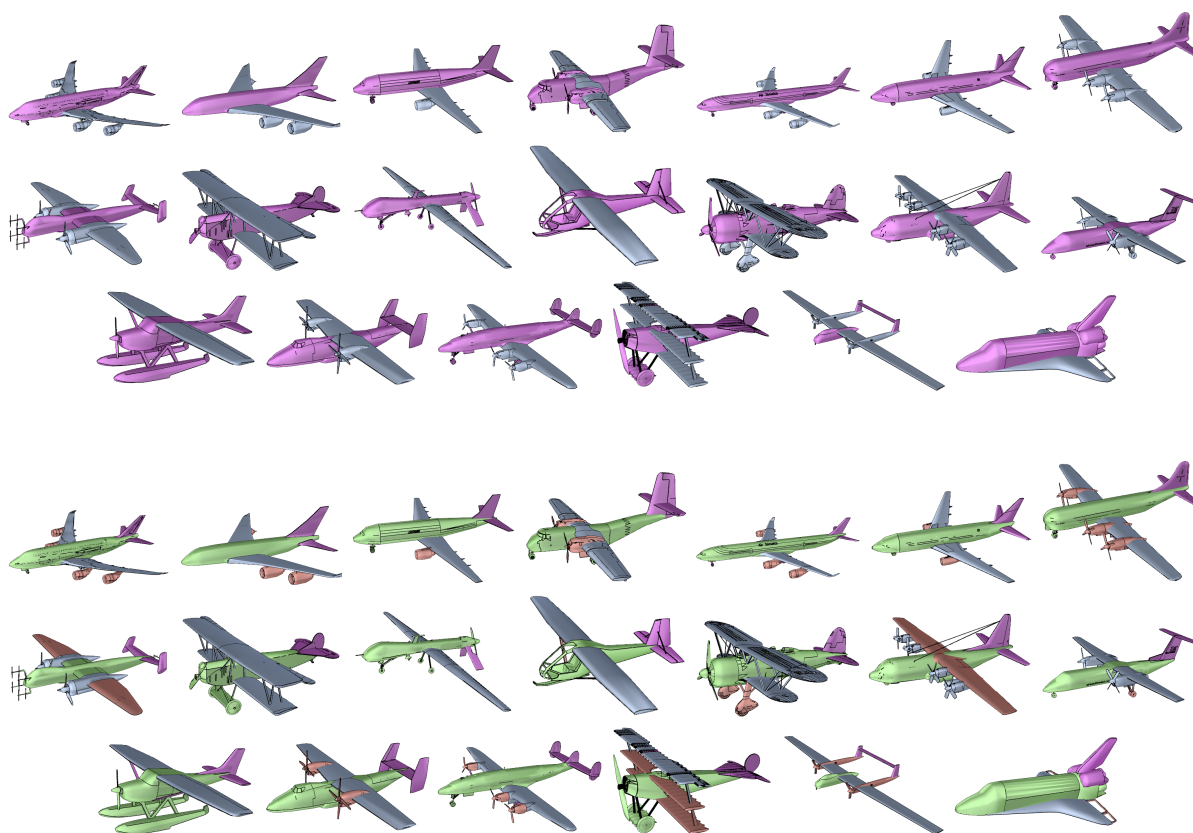
**Results for all the sets.** In Figures 3–8, we show the complete results of the co-hierarchical analysis for all the sets, in the form of hierarchical segmentations. Note that a few shapes with a small number of parts have a shallower hierarchy than the other shapes in the set, and so their hierarchies for lower levels can be identical to one of the hierarchies at a higher level.



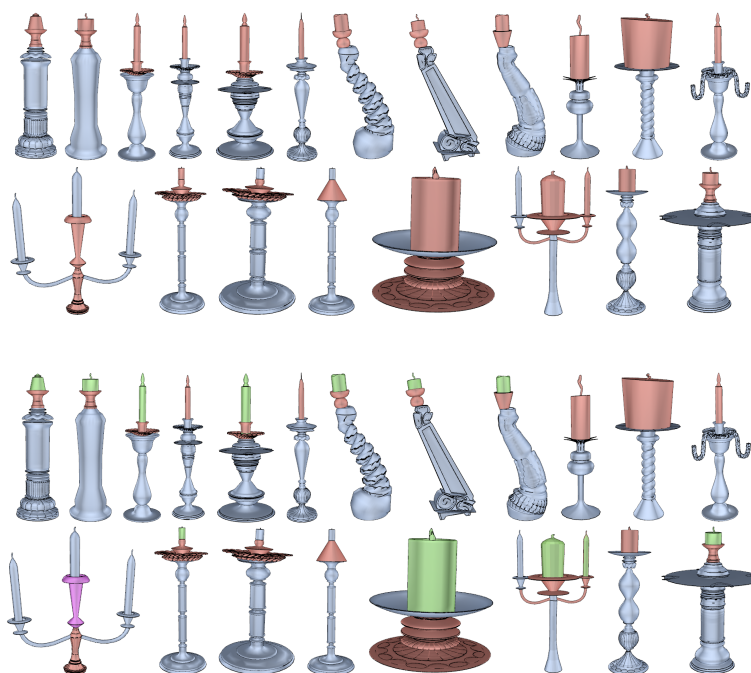
**Figure 2:** Embedding and clustering of a set with mixed categories of objects obtained with the select-and-cluster scheme. Note how shapes that are structurally similar tend to be in the same cluster.



**Figure 3:** Consistent hierarchical segmentation results corresponding to structural co-hierarchies obtained for the set of chairs.



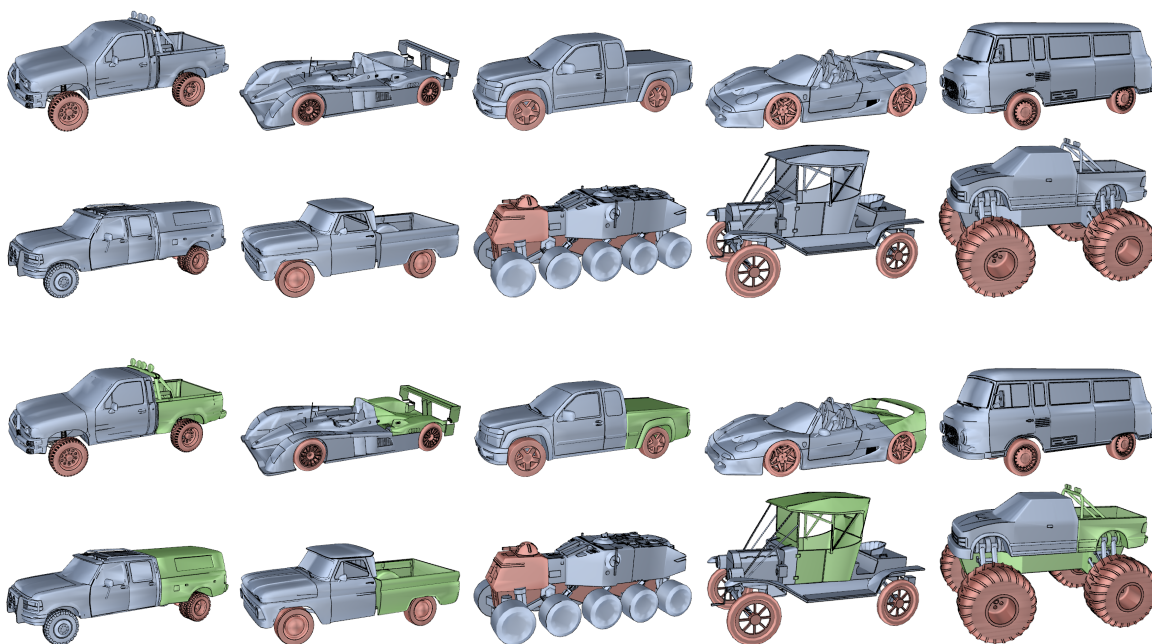
**Figure 4:** Consistent hierarchical segmentation results corresponding to structural co-hierarchies obtained for the set of airplanes.



**Figure 5:** Consistent hierarchical segmentation results corresponding to structural co-hierarchies obtained for the set of candles.



**Figure 6:** Consistent hierarchical segmentation results corresponding to structural co-hierarchies obtained for the set of lamps.



**Figure 7:** Consistent hierarchical segmentation results corresponding to structural co-hierarchies obtained for the set of vehicles.





**Figure 8:** Consistent hierarchical segmentation results corresponding to structural co-hierarchies obtained for the set of velocipedes.