

Appendix A

Efficient co-alignment of shape collections results

In this Appendix, we present the full set of alignment results and per-dataset comparisons for our efficient co-alignment method.

Comparisons of our method and UNIFORM method for all datasets can be found in Figure A.1. Comparisons of our method with clustering and our method without clustering for all datasets can be found in Figure A.2. Comparison of our unsupervised pipeline and our supervised pipeline averaged over all datasets can be found in Figure A.3. Comparisons of our unsupervised pipeline and our supervised pipeline for all datasets can be found in Figure A.4. Renderings of all the shapes in our datasets, before co-alignment (odd rows - in gray) and after co-alignment can be found in Figures A.5-A.15. Renderings of all the shapes in the noisy cars dataset that we used to test our method's performance on outlier shapes can be found in Figure A.7.

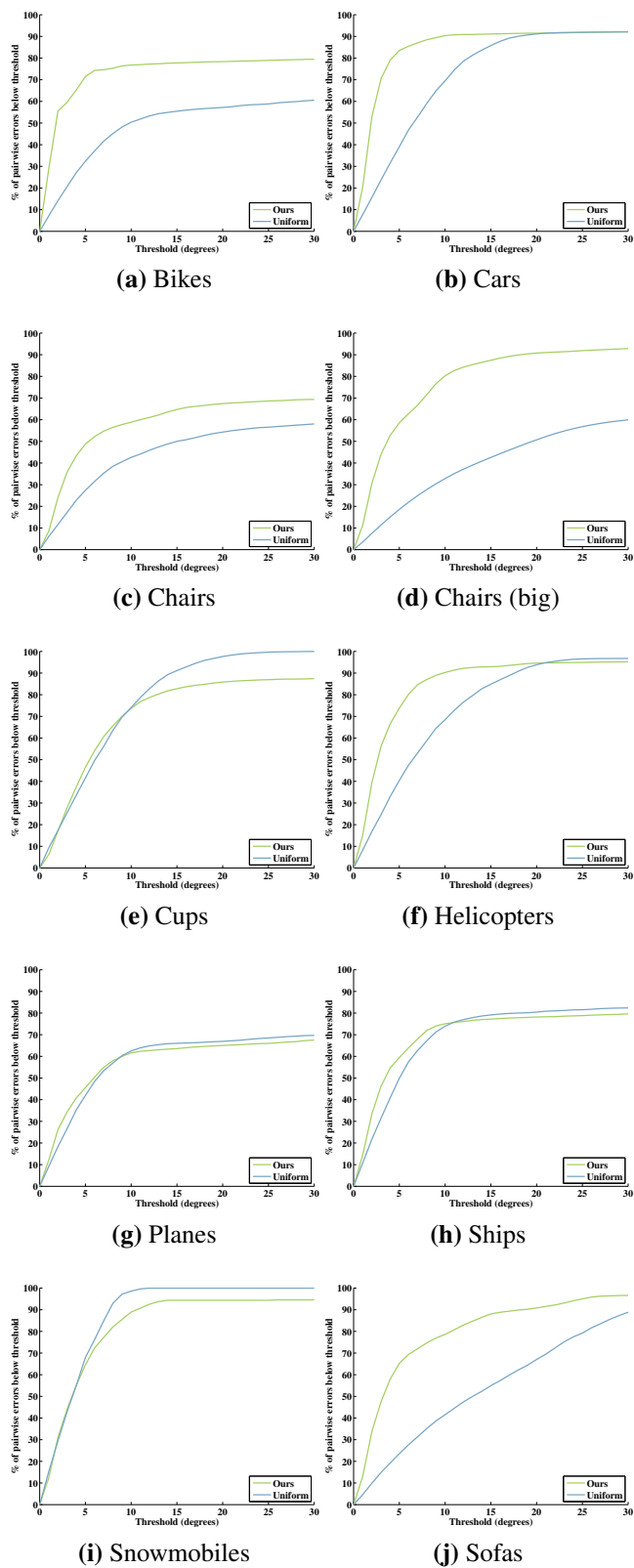


Figure A.1: Comparison of our method (green) and UNIFORM method (blue), for all datasets

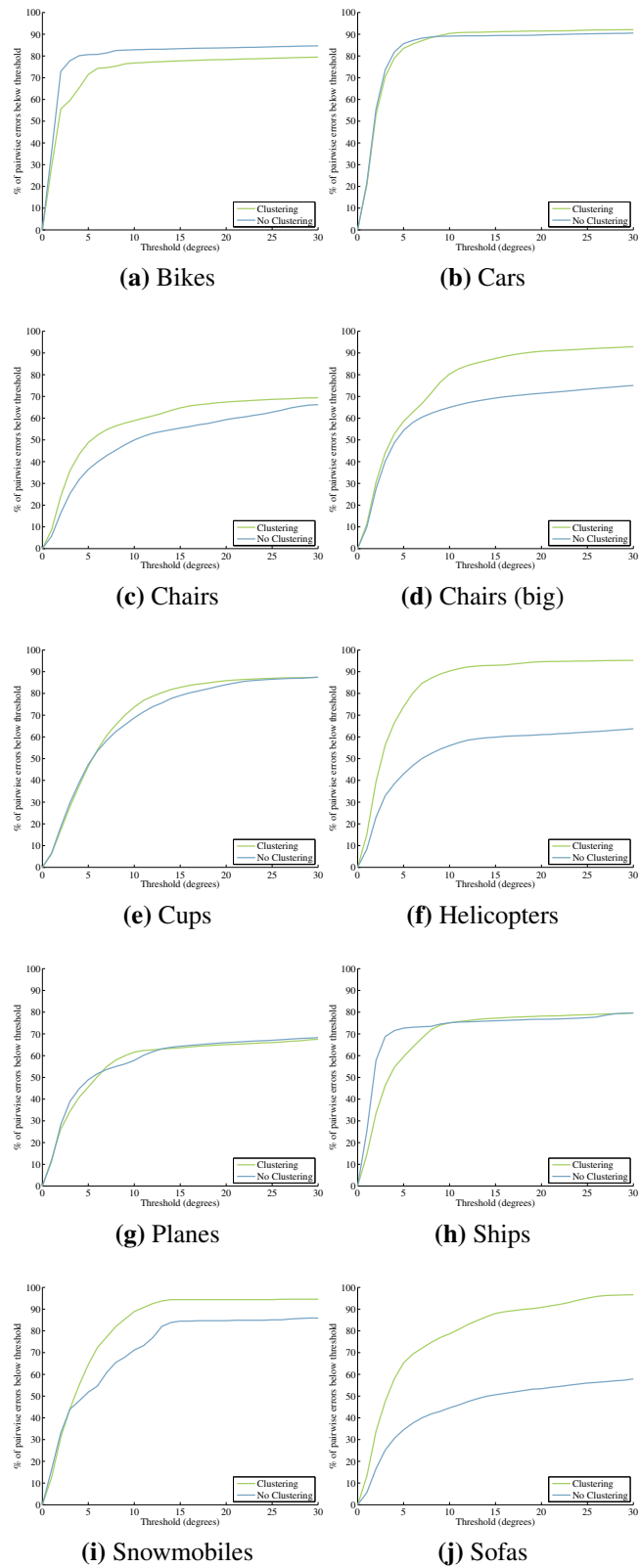


Figure A.2: Comparison of our method with clustering (green) and our method without clustering (blue), for all datasets

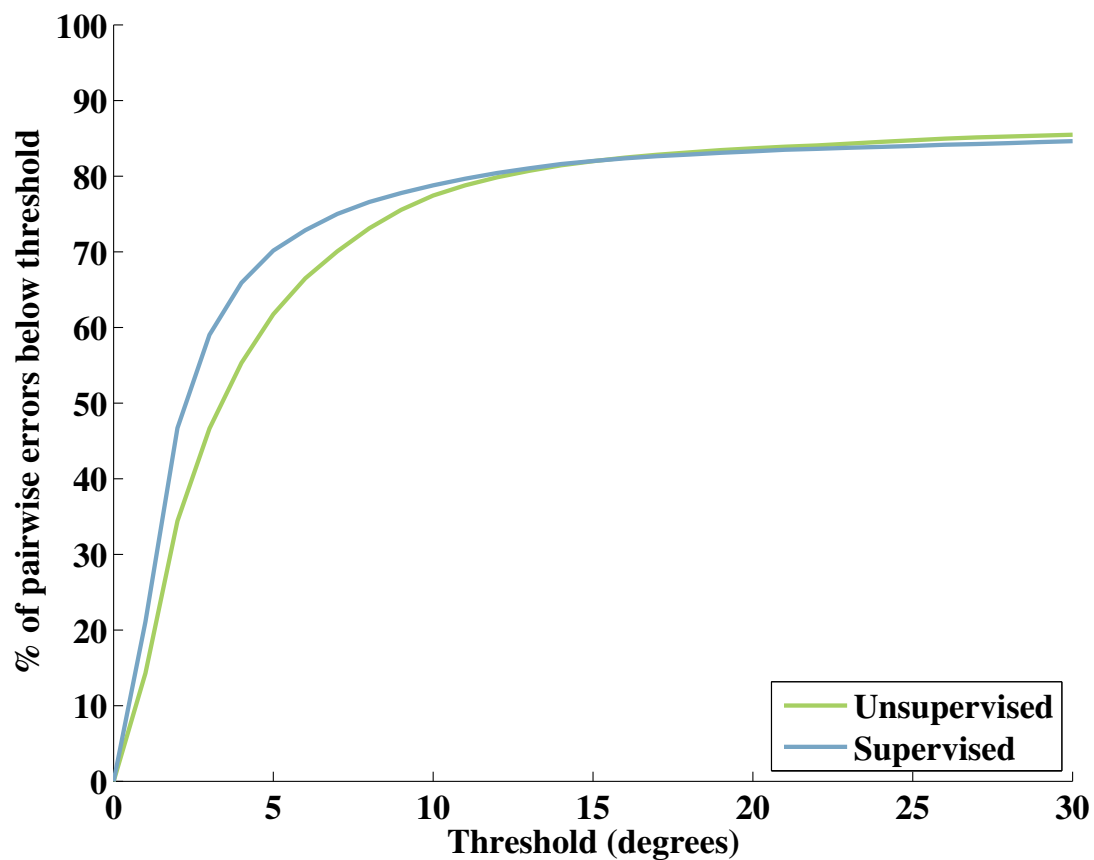


Figure A.3: This figure illustrates the accuracy of our full unsupervised alignment pipeline (green) in comparison to the accuracy achieved if a human aligns shapes between clusters manually (blue). We plot the fraction of models aligned within a prescribed angle threshold, averaged over our 10 datasets.

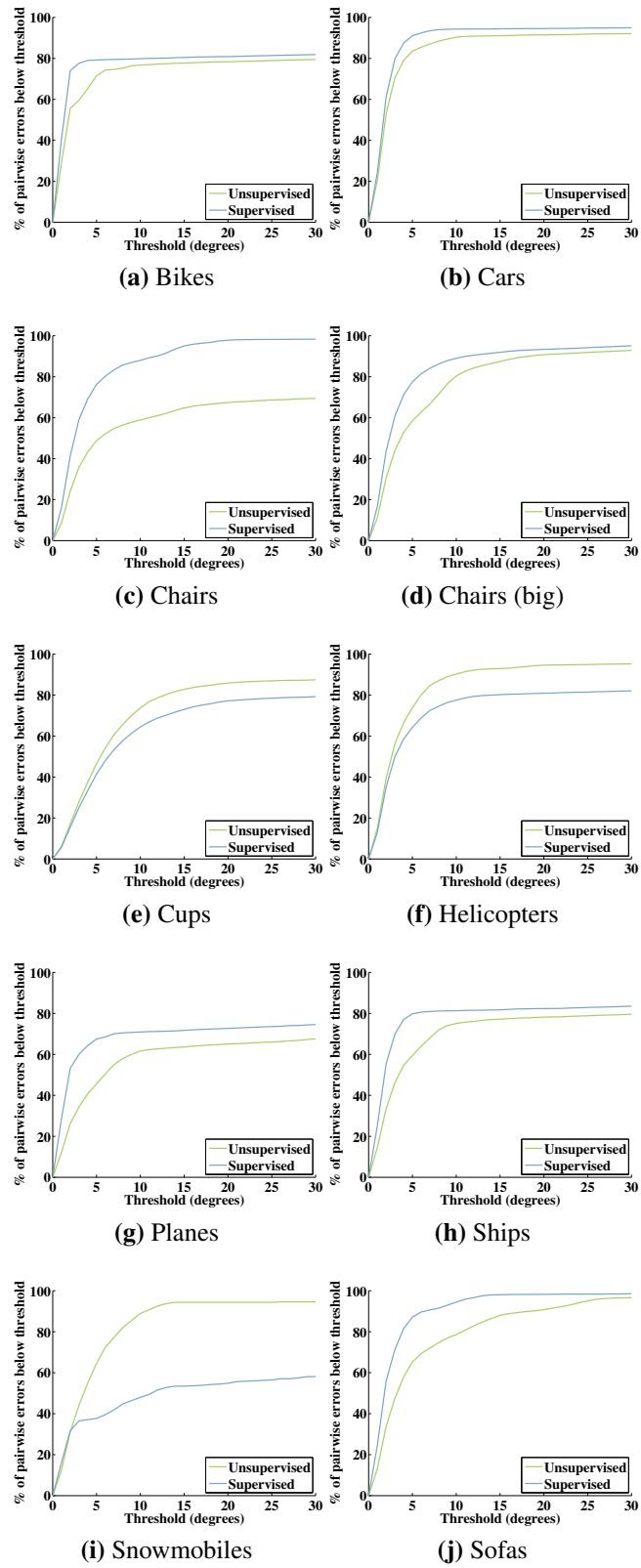
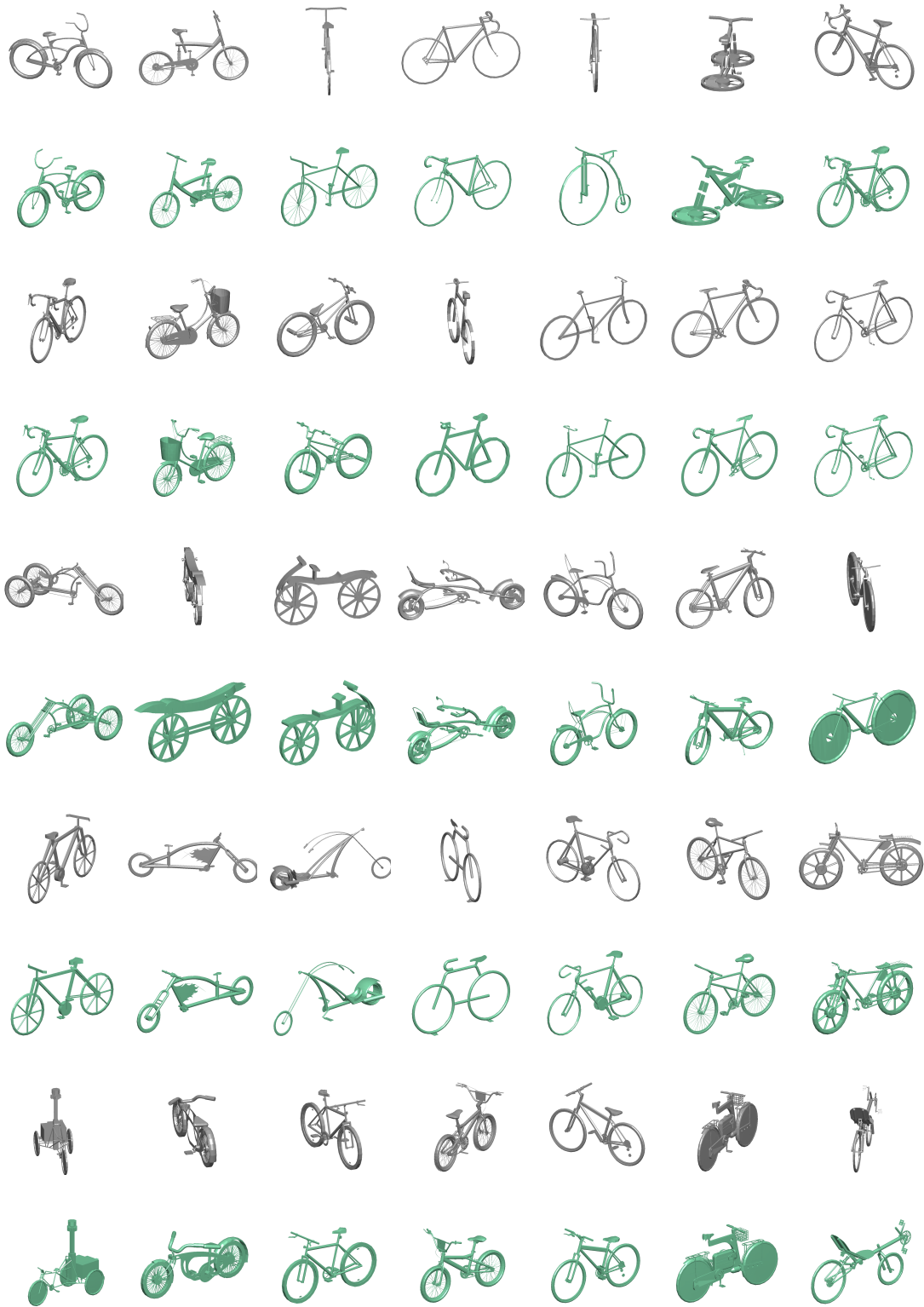
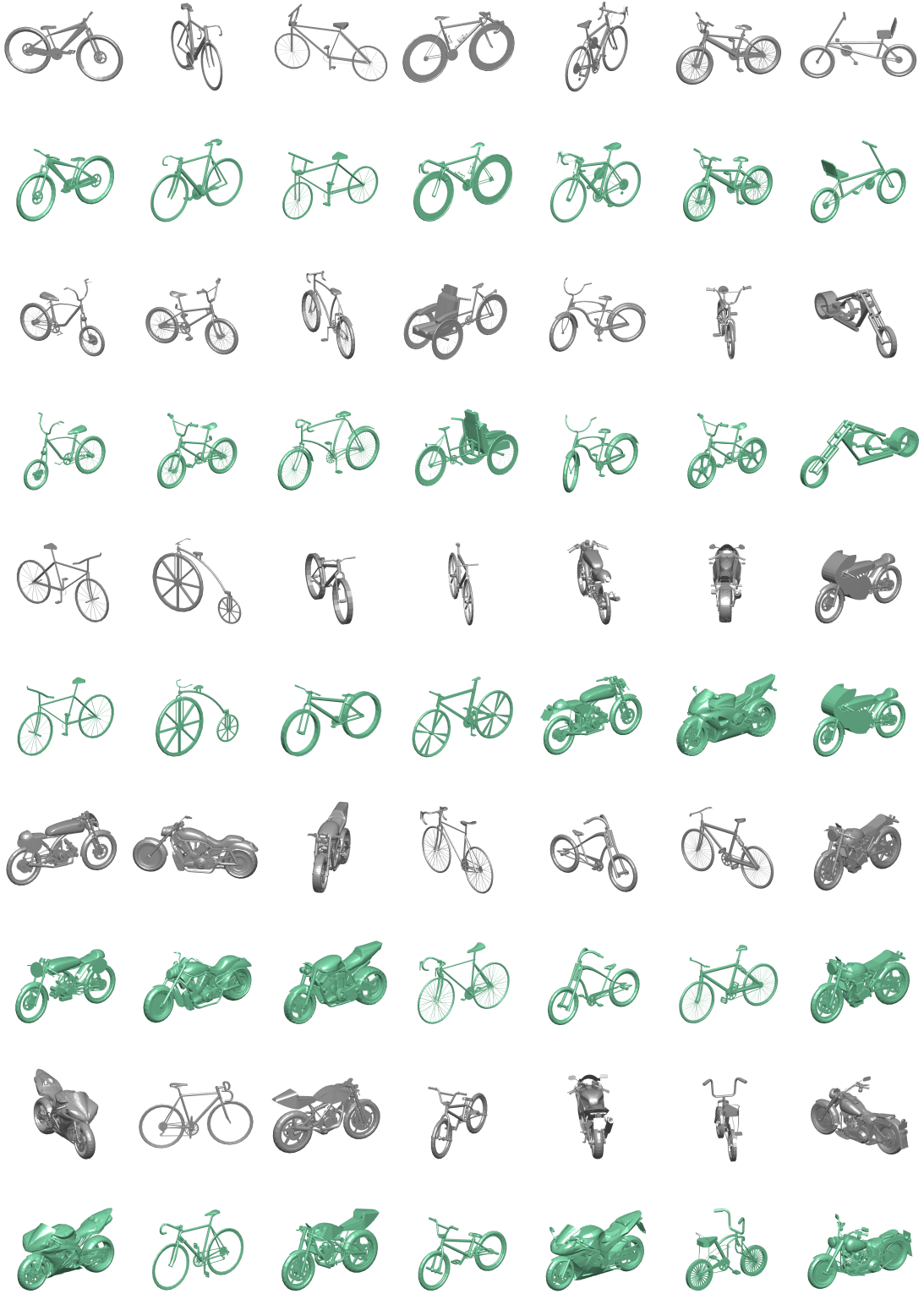


Figure A.4: Comparison of our unsupervised pipeline (green) and our supervised pipeline (blue), for all datasets





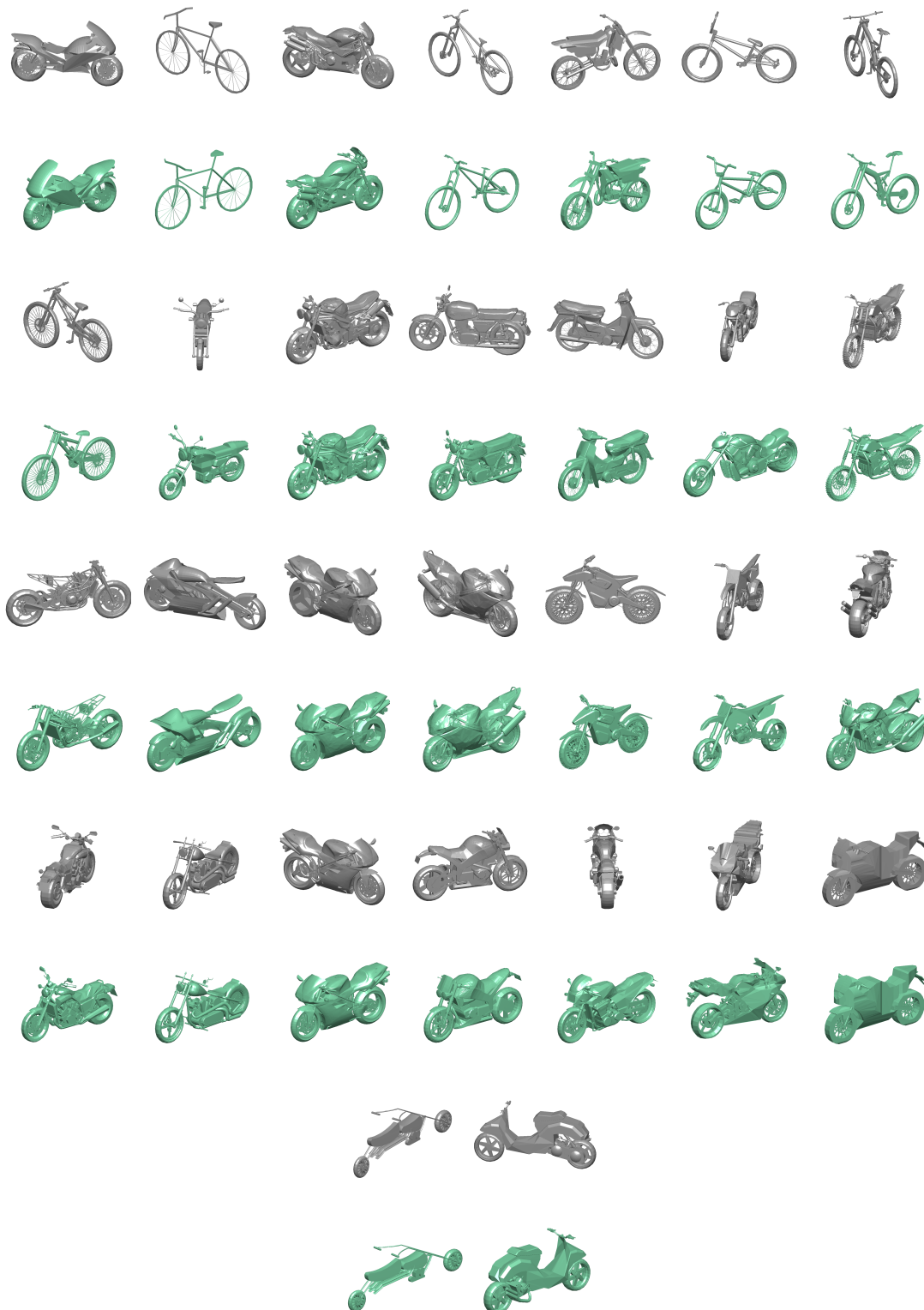
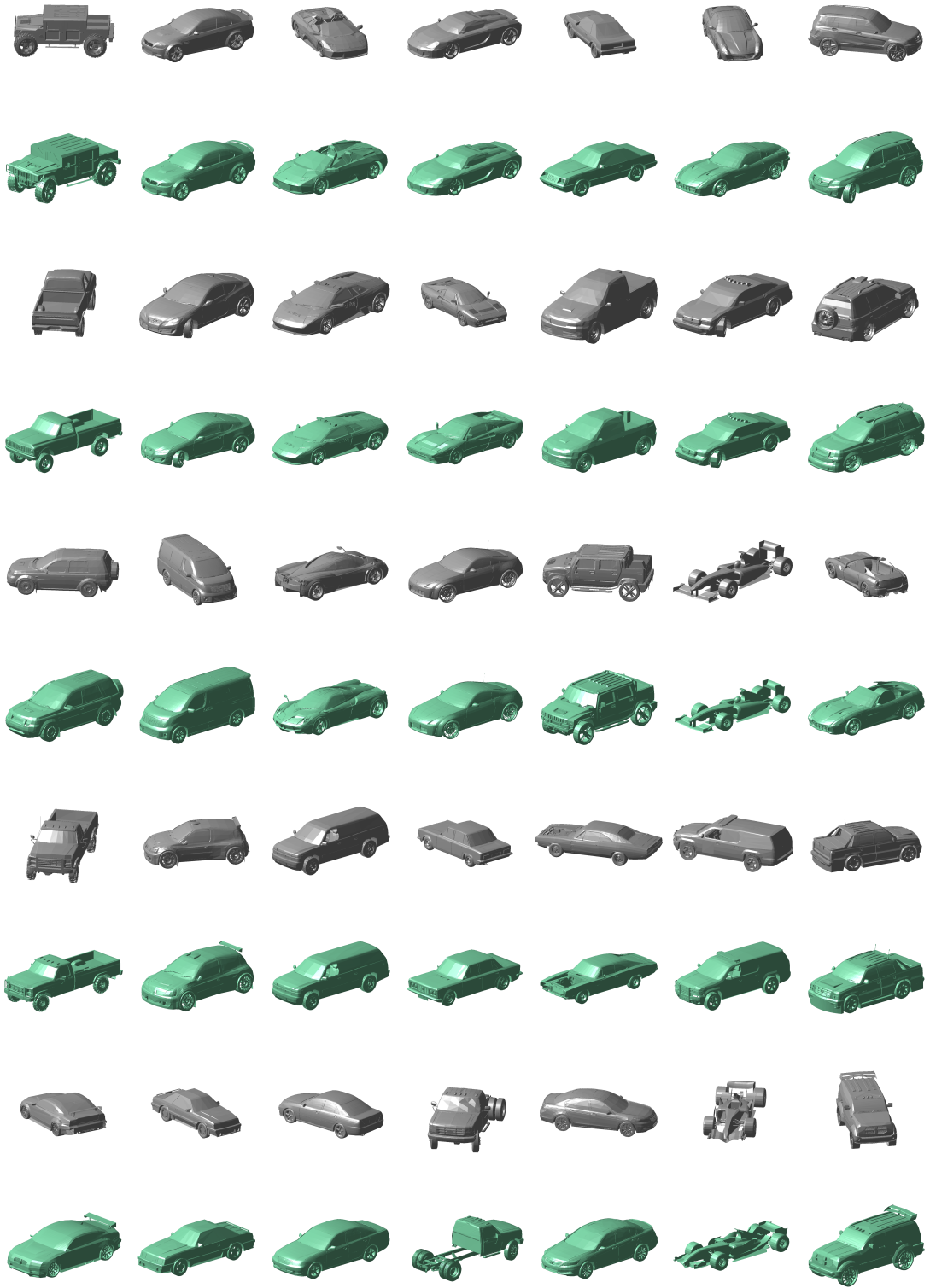
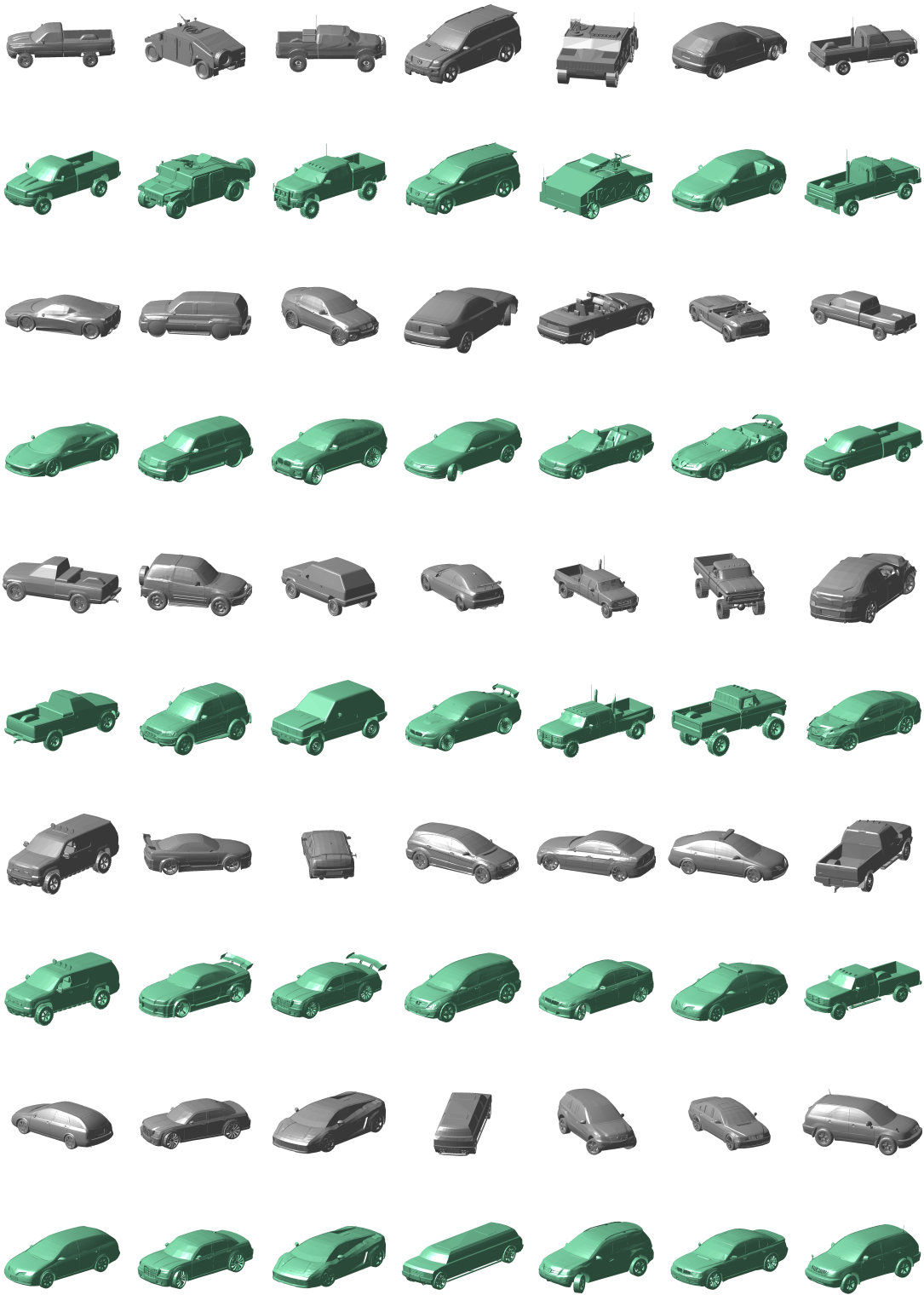


Figure A.5: Bikes dataset before (odd rows - in gray) and after (even rows - in green) alignment.





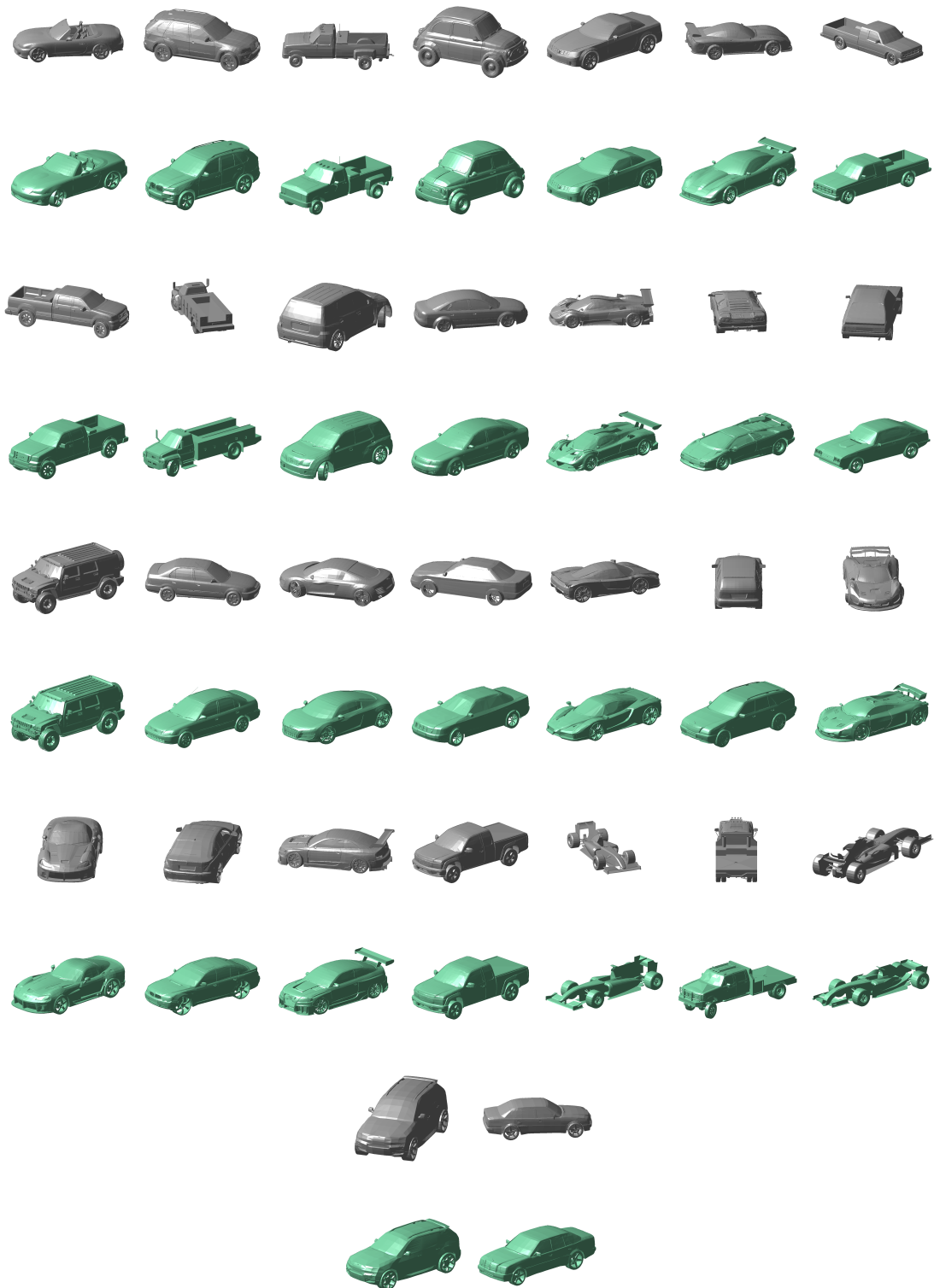
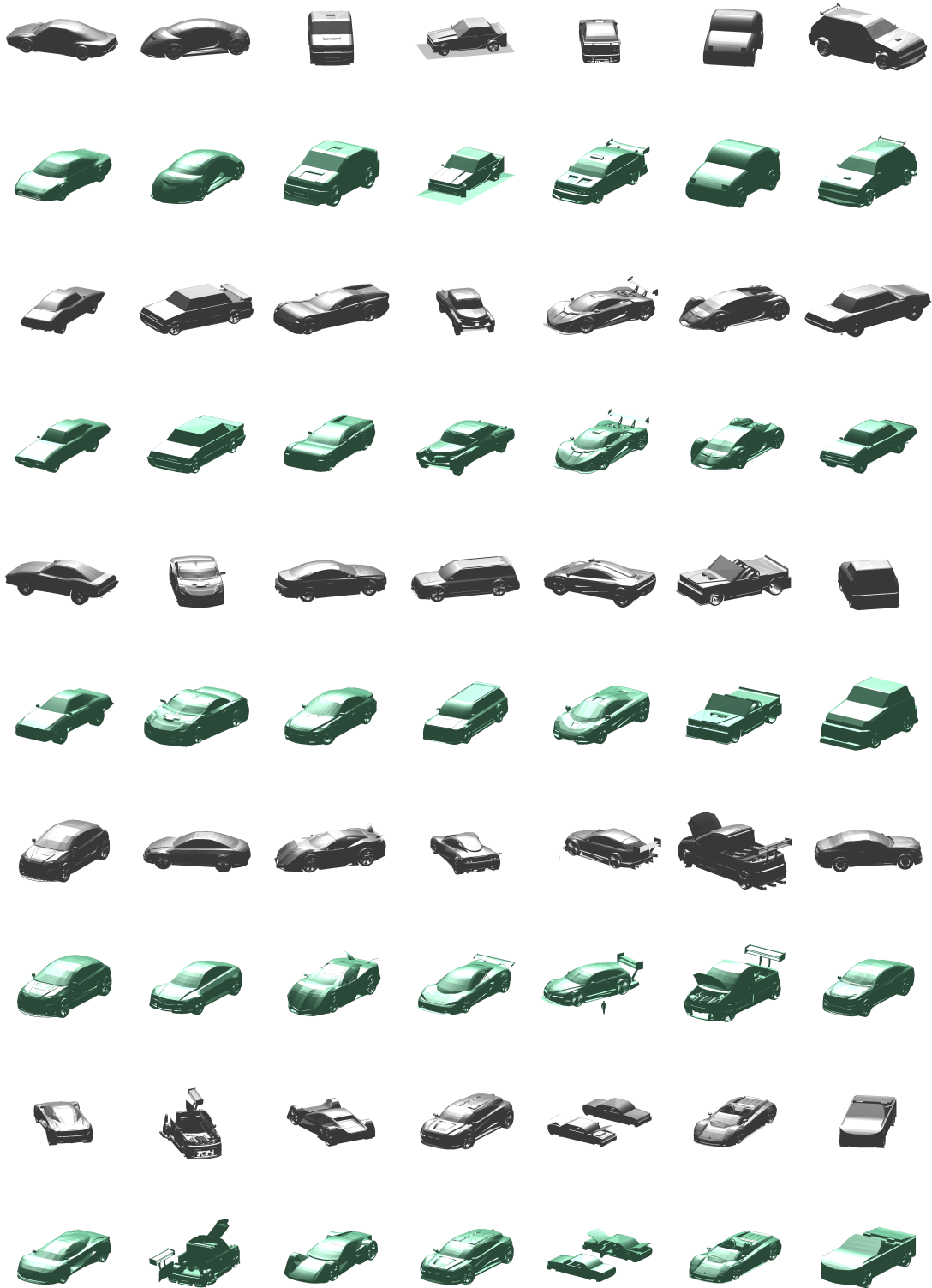
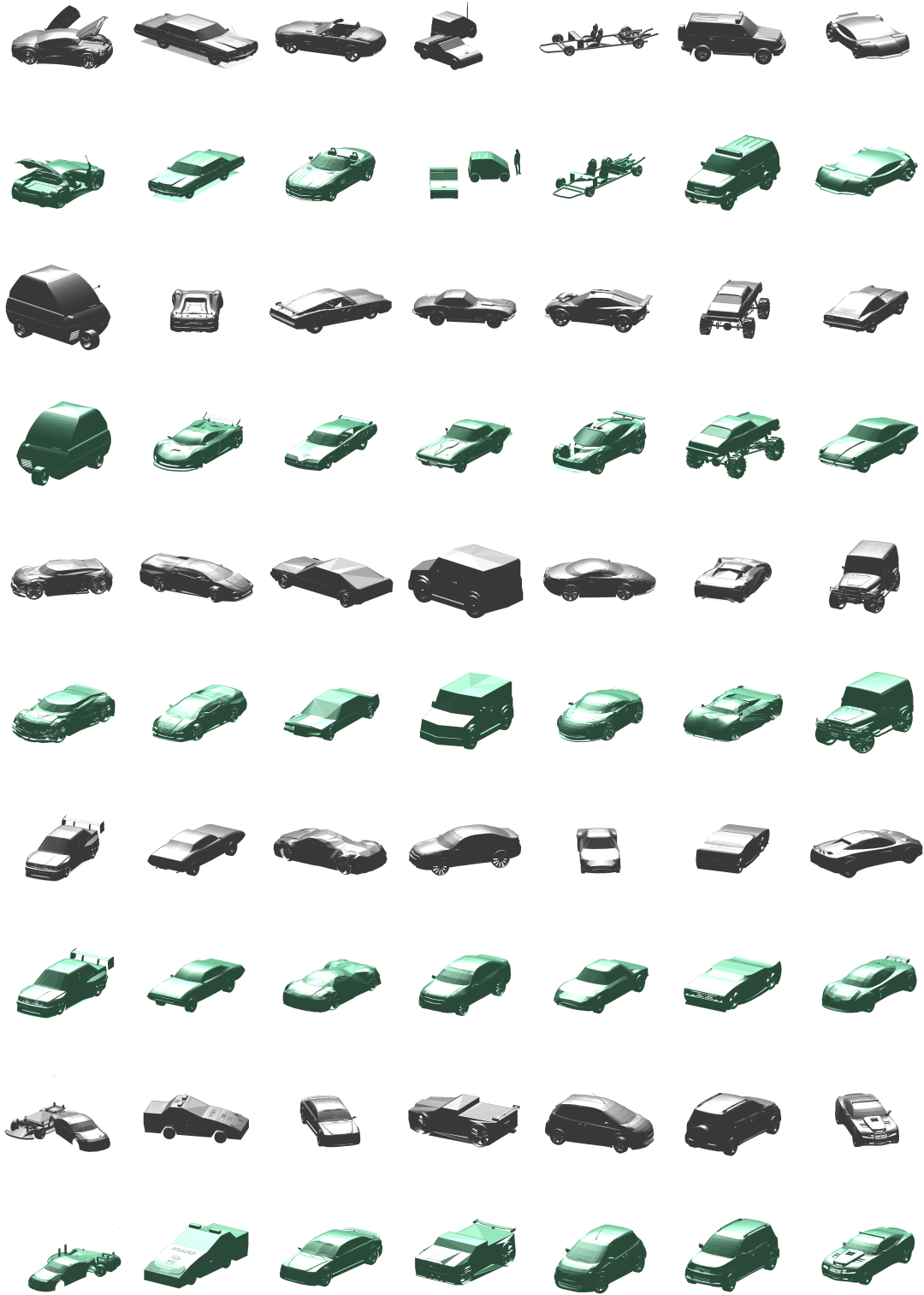


Figure A.6: Cars dataset before (odd rows - in gray) and after (even rows - in green) alignment.







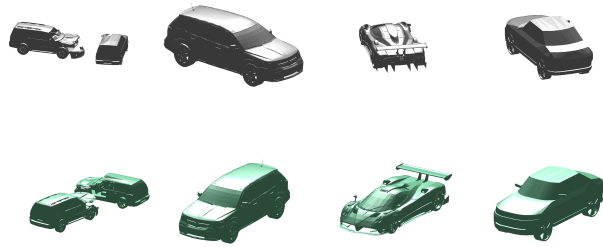


Figure A.7: Noisy cars dataset before (odd rows - in gray) and after (even rows - in green) alignment.







Figure A.8: Chairs dataset before (odd rows - in gray) and after (even rows - in green) alignment.













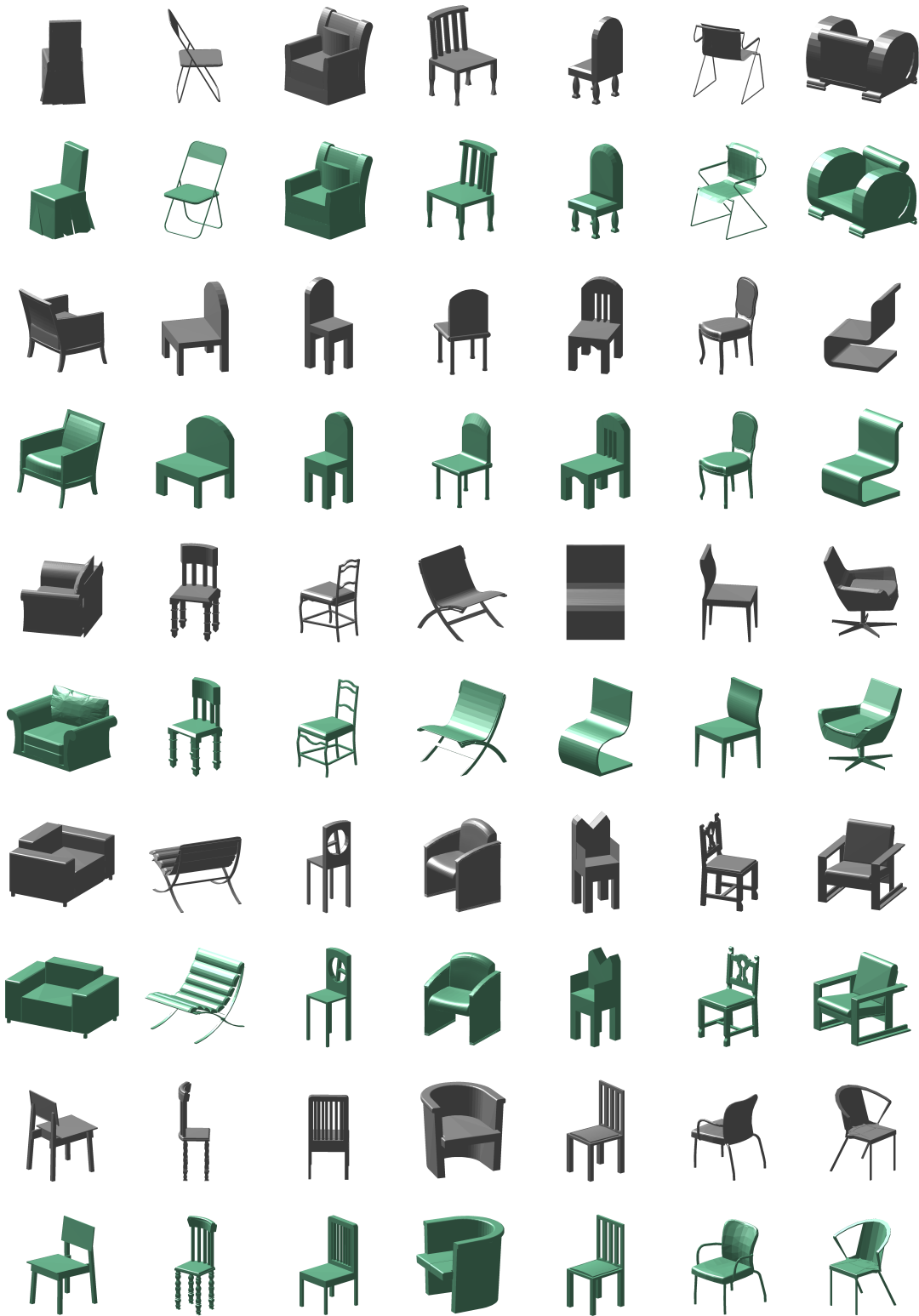












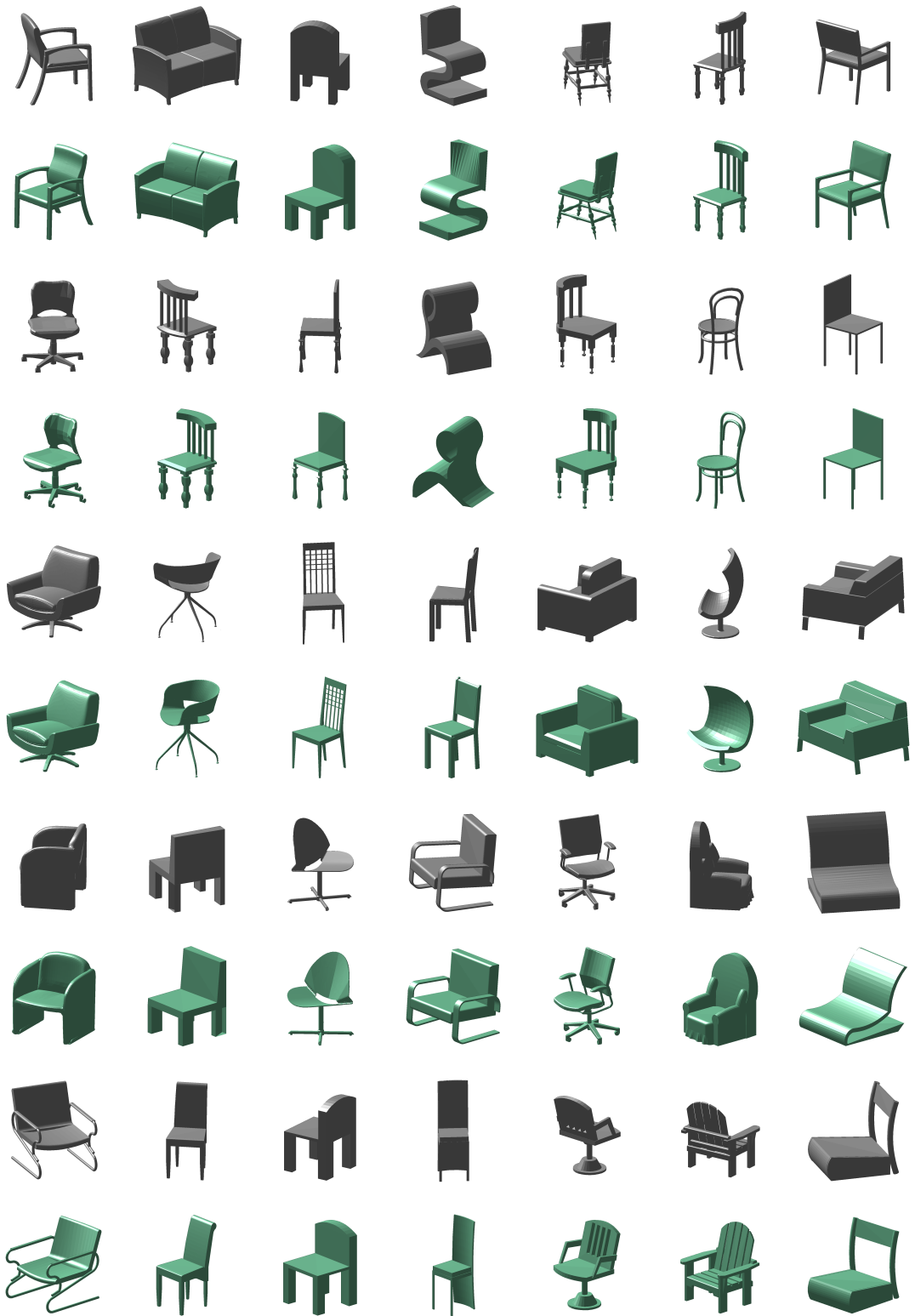












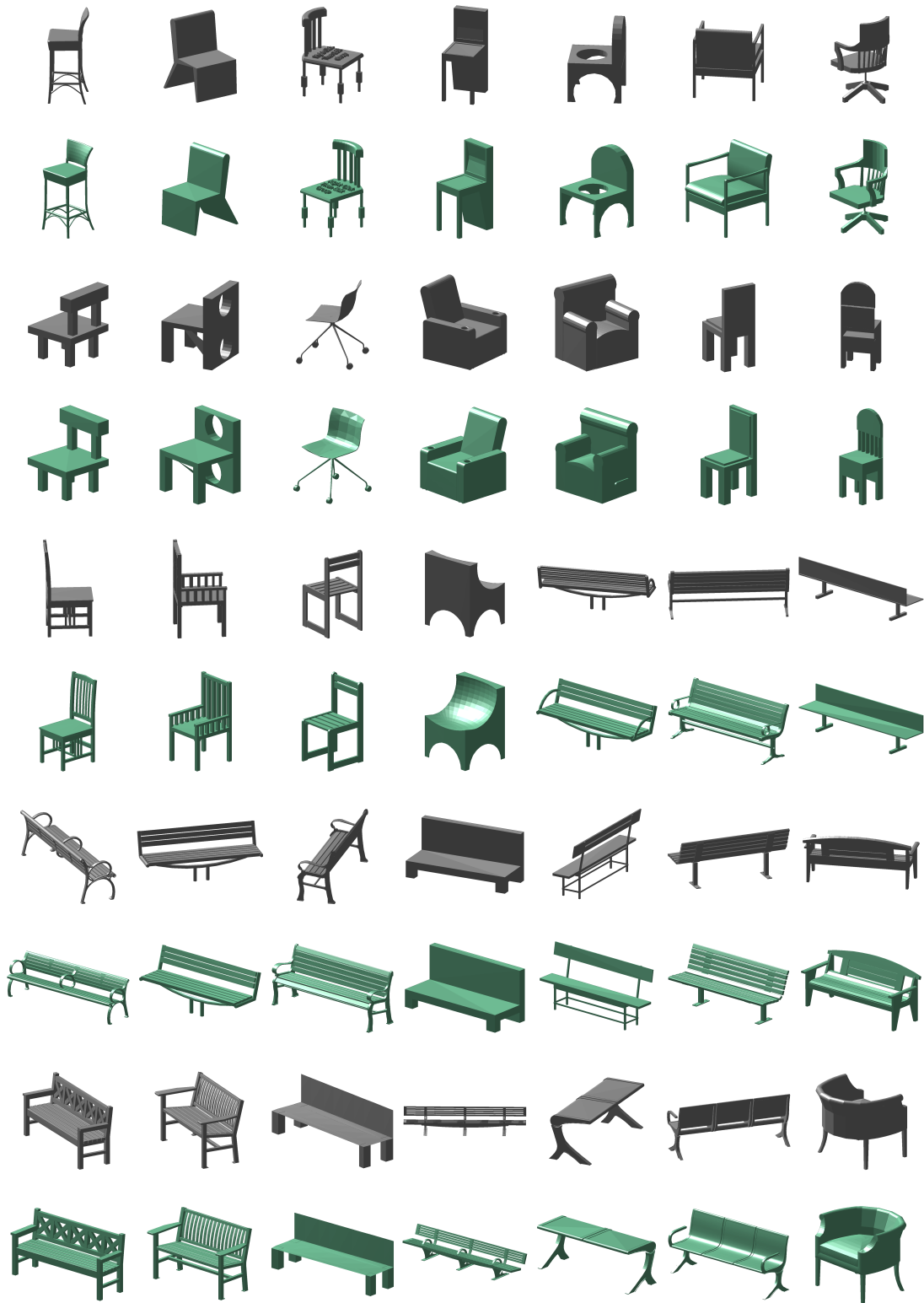




















Figure A.9: Chairs (big) dataset before (odd rows - in gray) and after (even rows - in green) alignment.



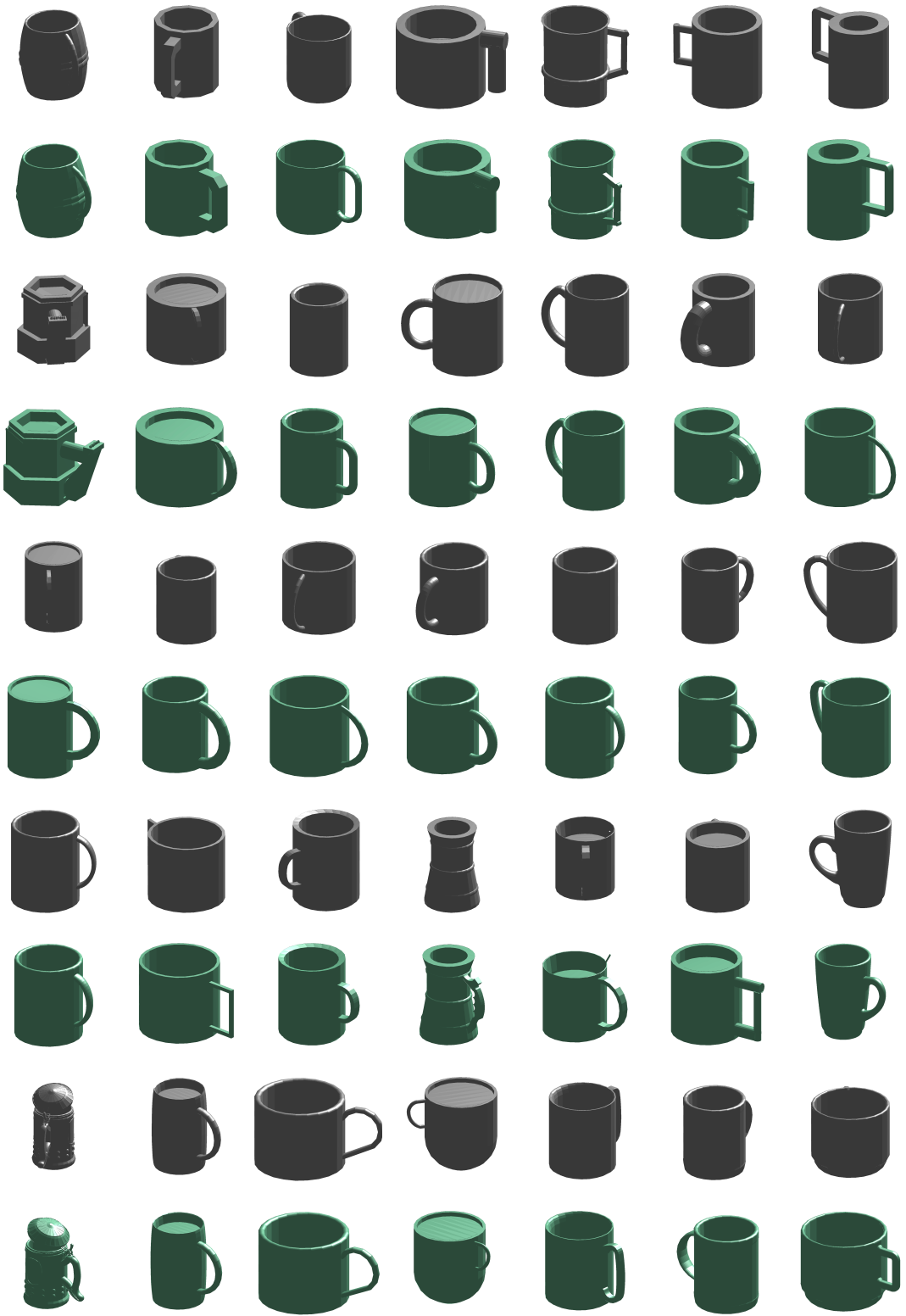
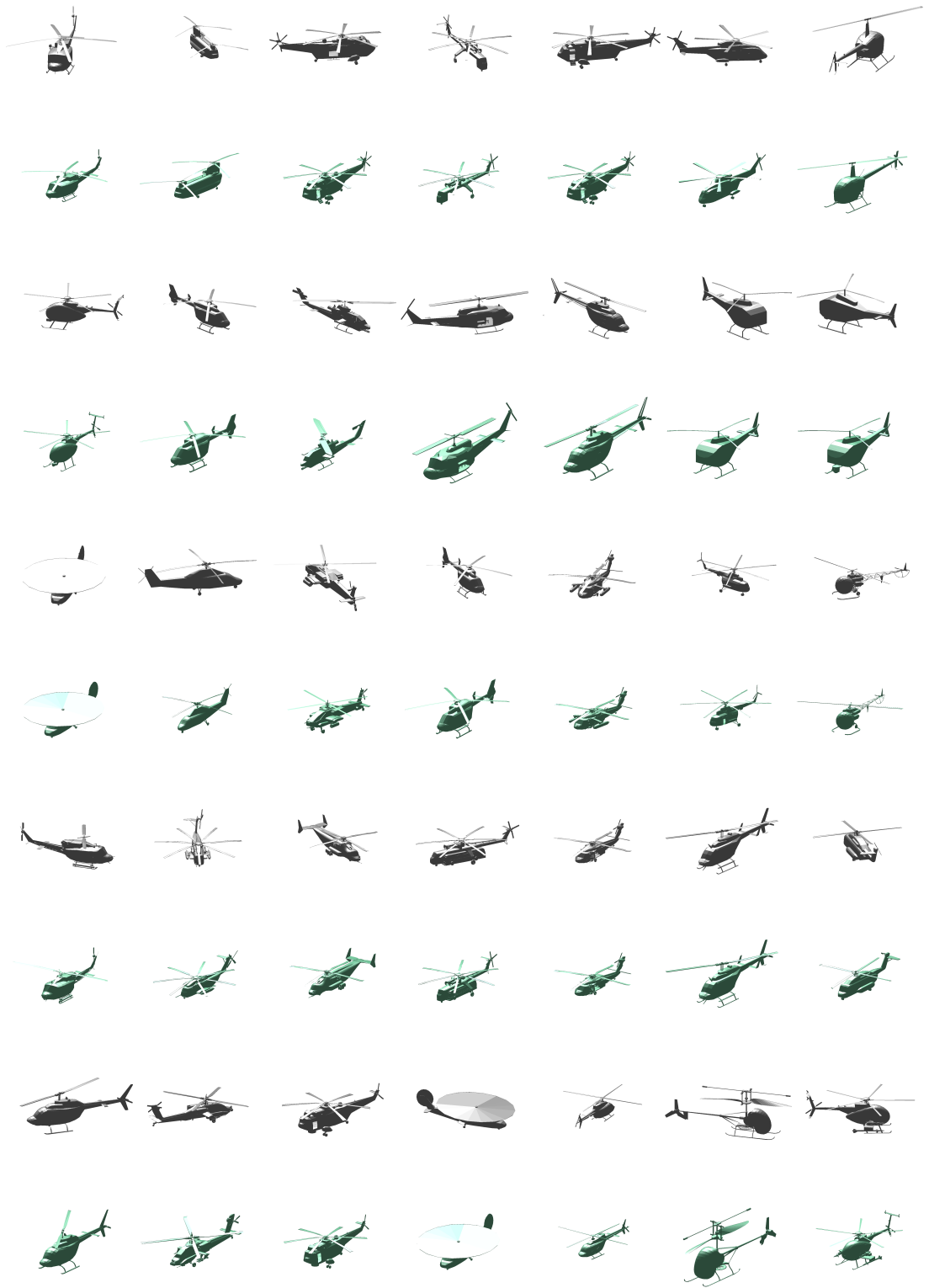




Figure A.10: Cups dataset before (odd rows - in gray) and after (even rows - in green) alignment.



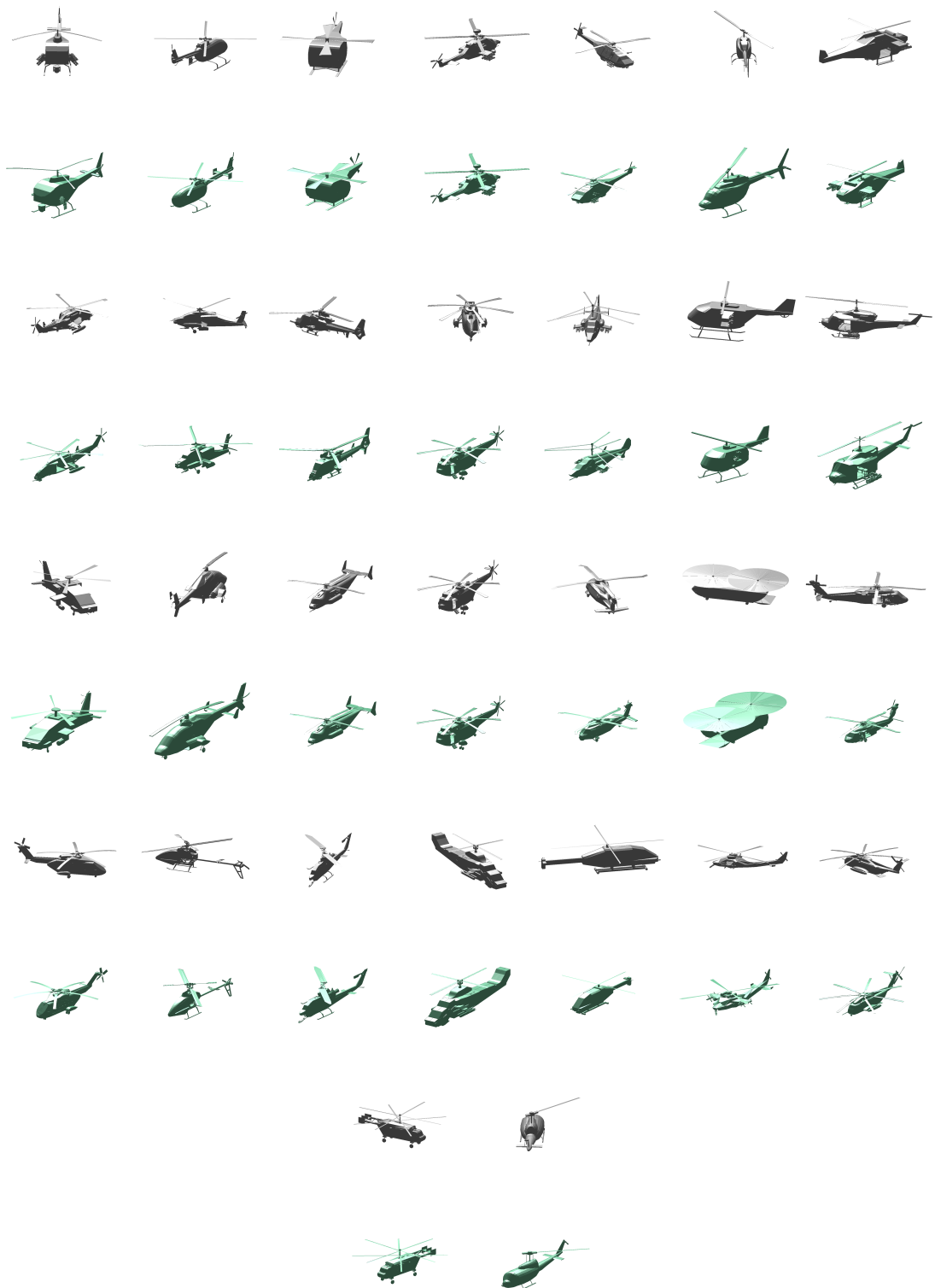
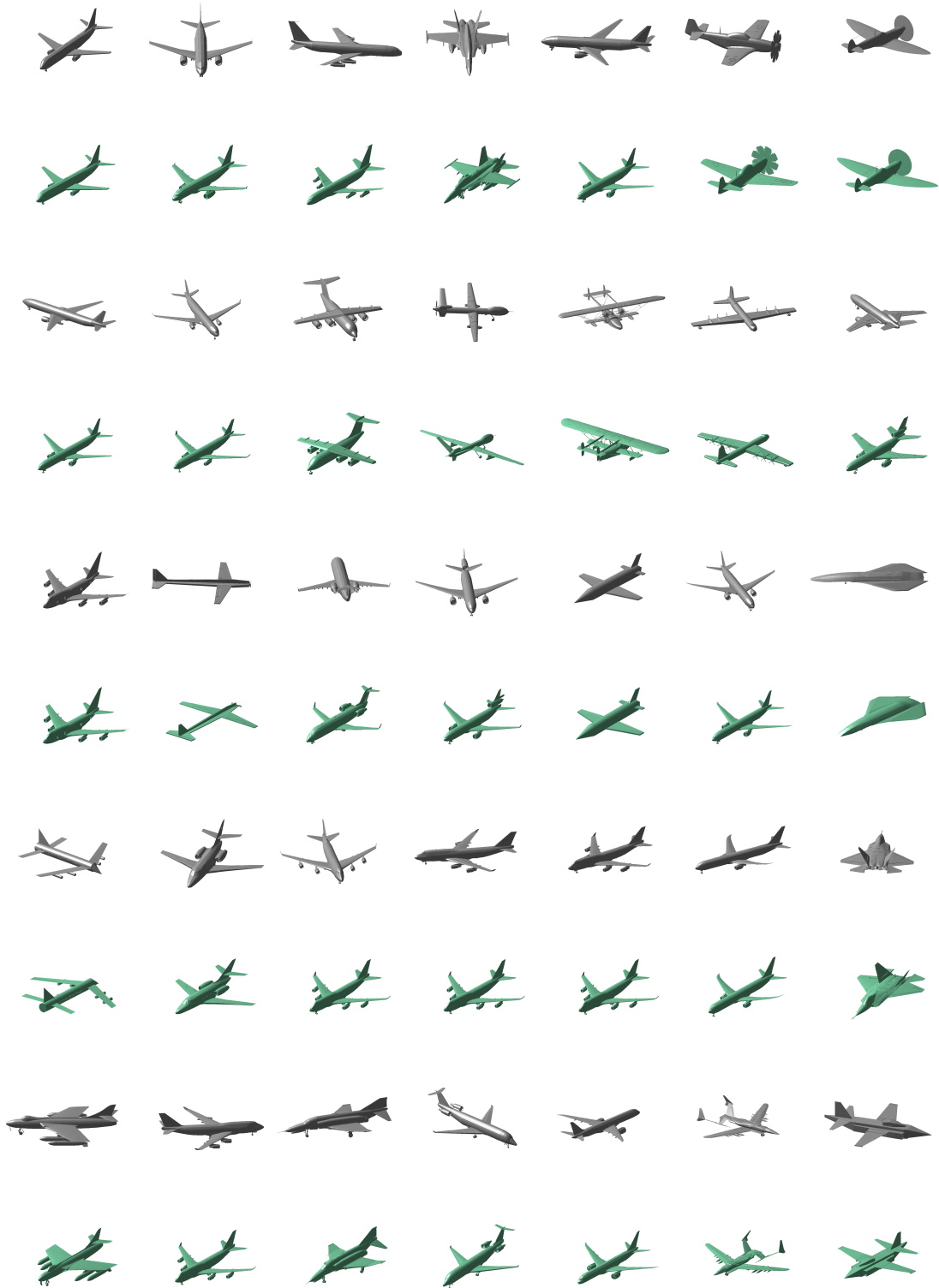
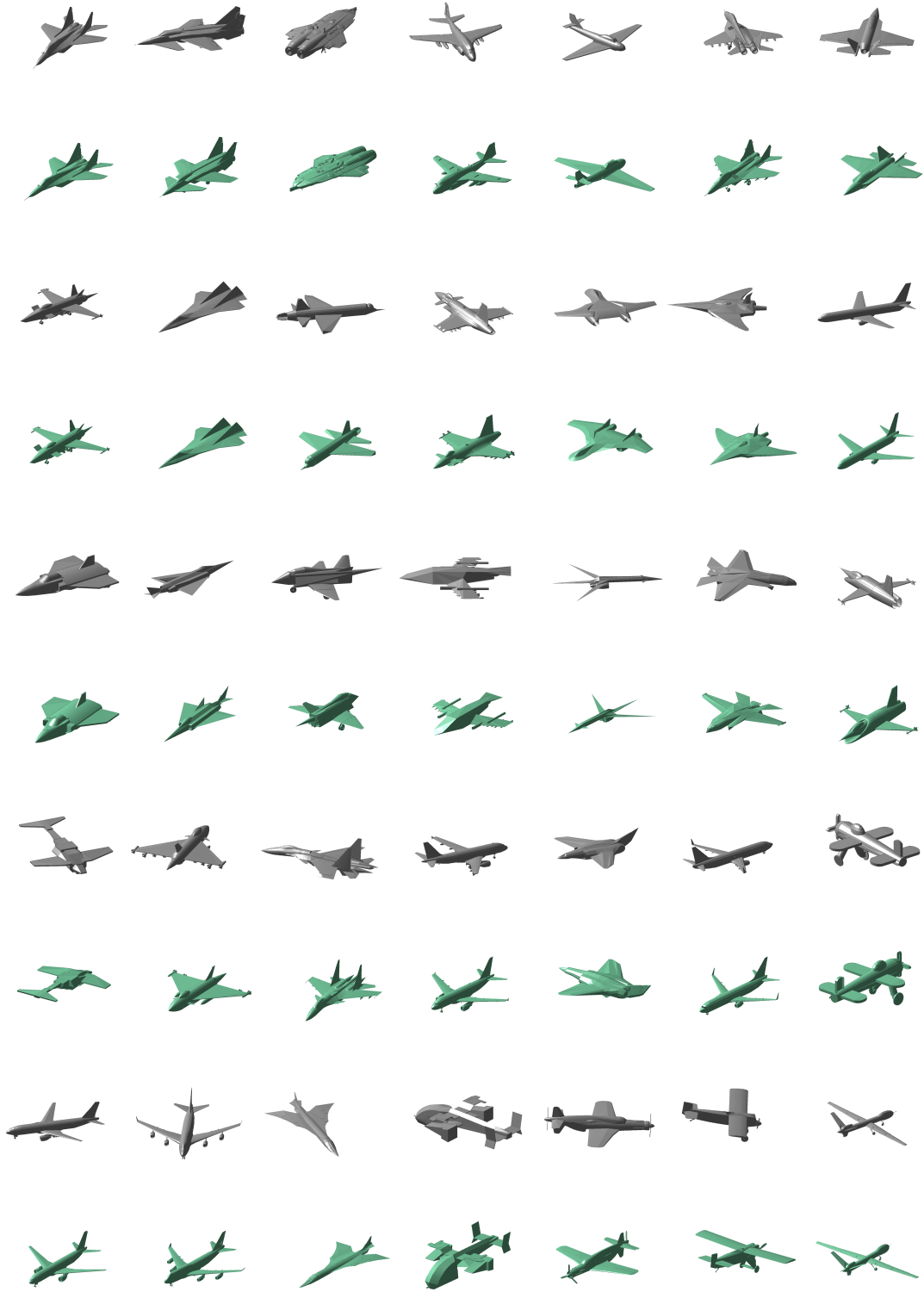


Figure A.11: Helicopters dataset before (odd rows - in gray) and after (even rows - in green) alignment.





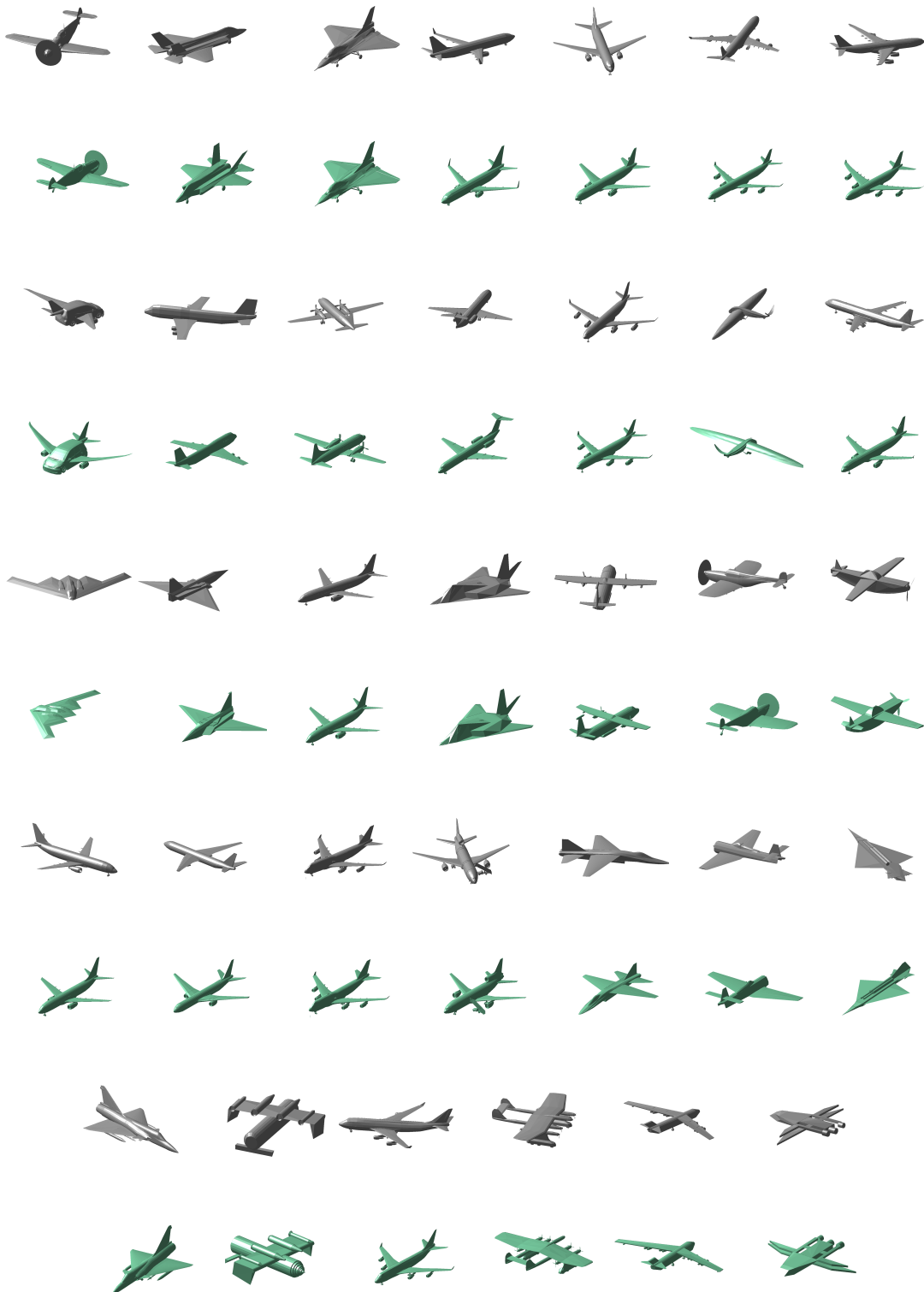
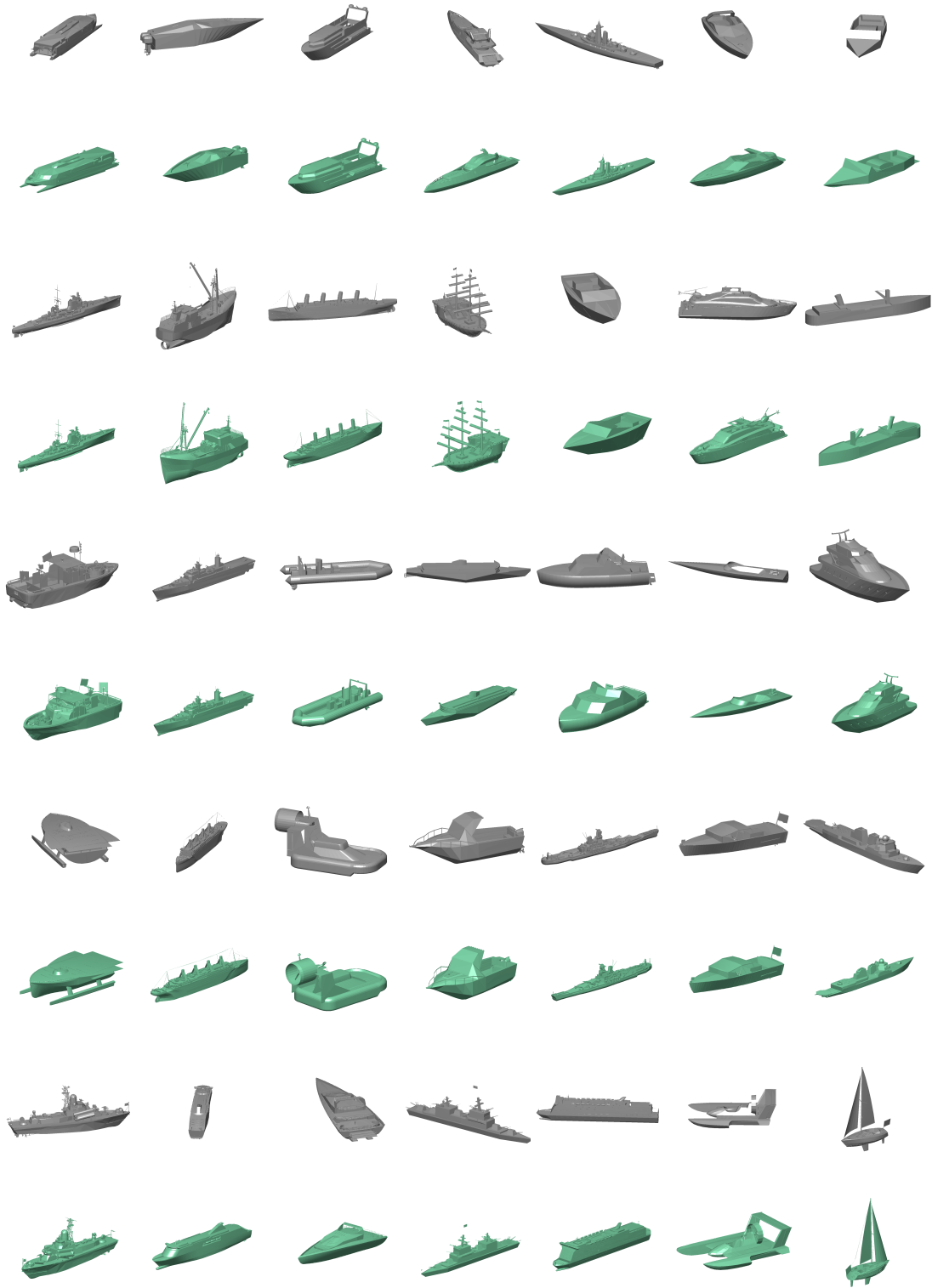


Figure A.12: Planes dataset before (odd rows - in gray) and after (even rows - in green) alignment.



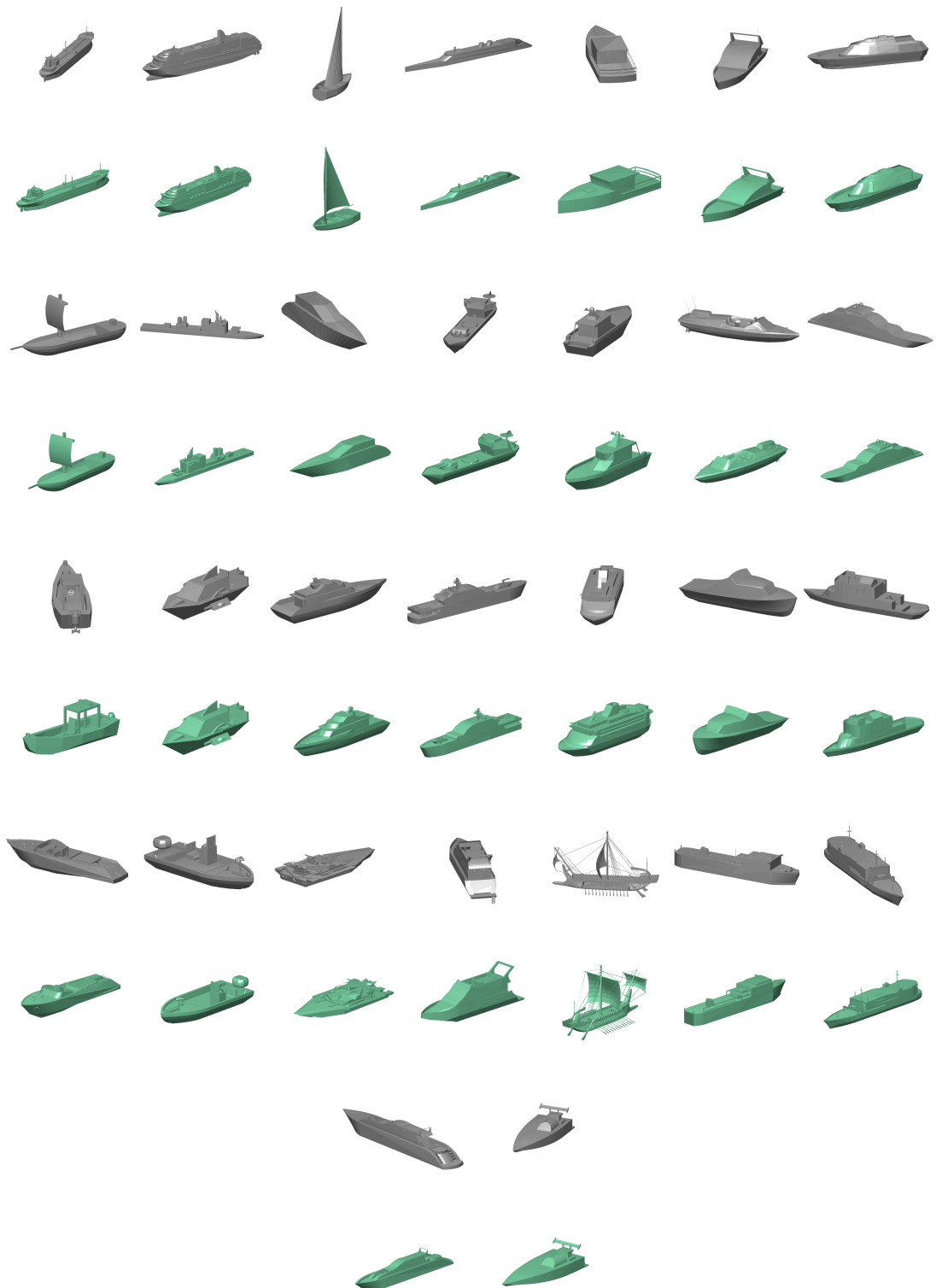
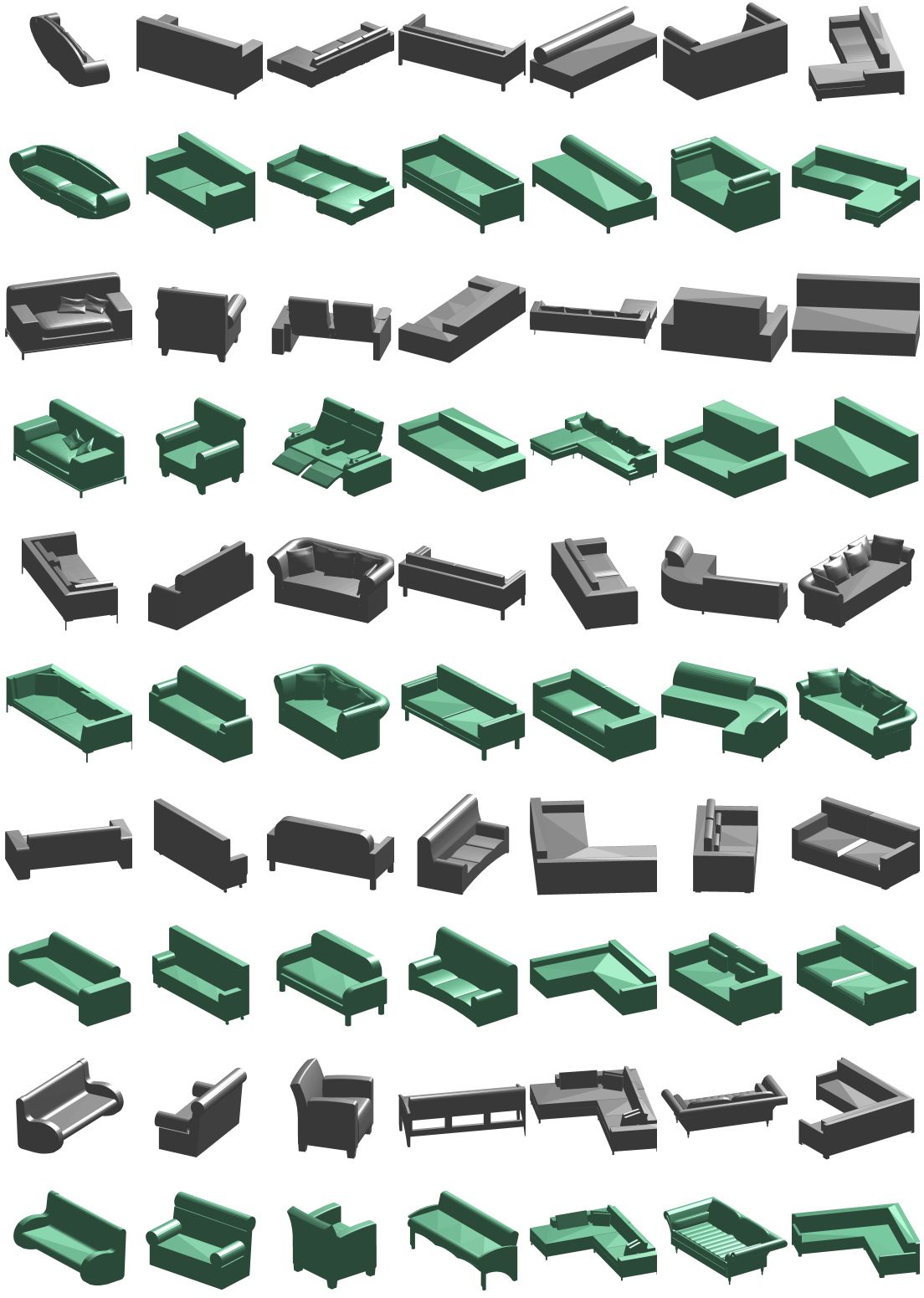
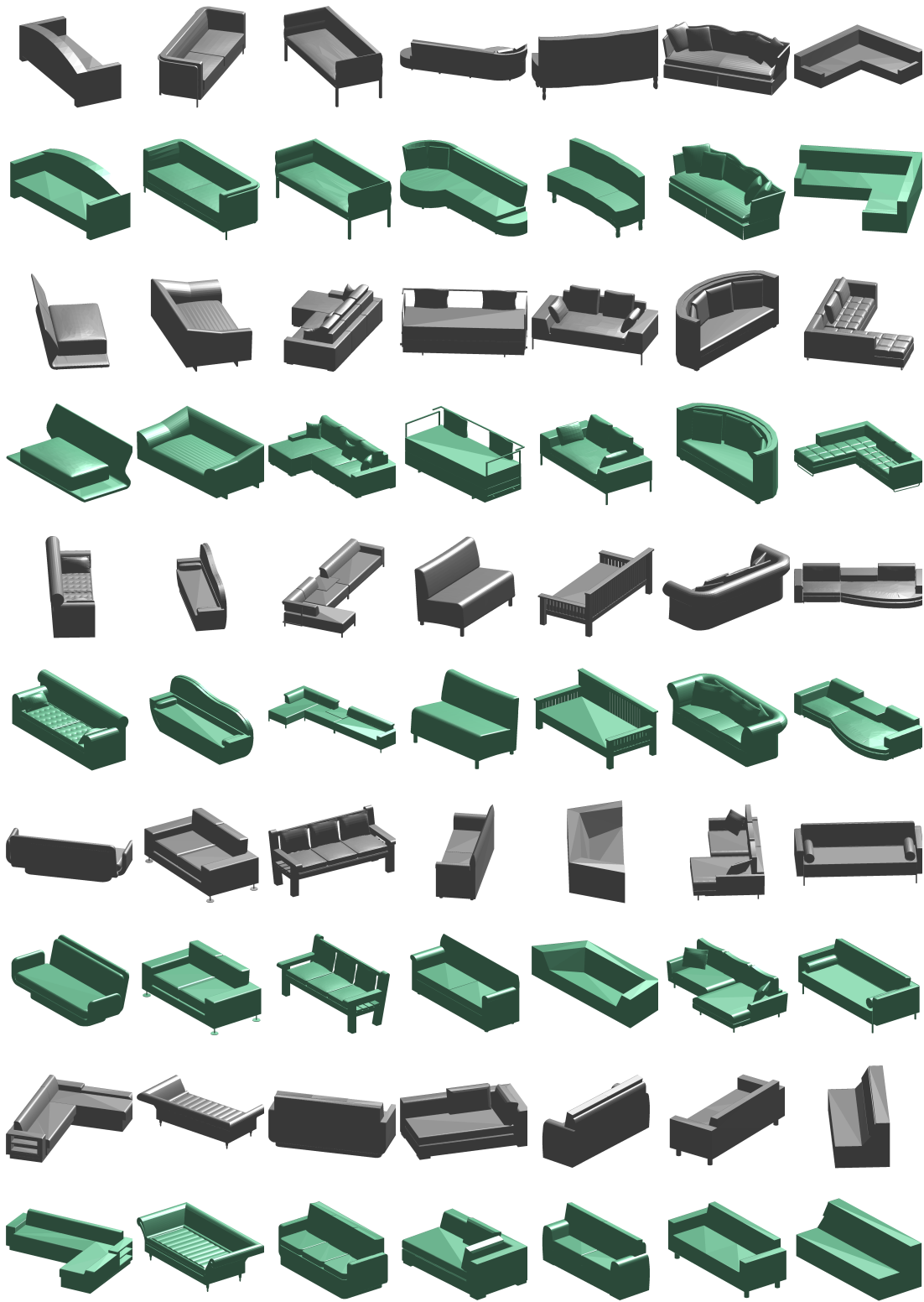


Figure A.13: Ships dataset before (odd rows - in gray) and after (even rows - in green) alignment.



Figure A.14: Snowmobiles dataset before (odd rows - in gray) and after (even rows - in green) alignment.





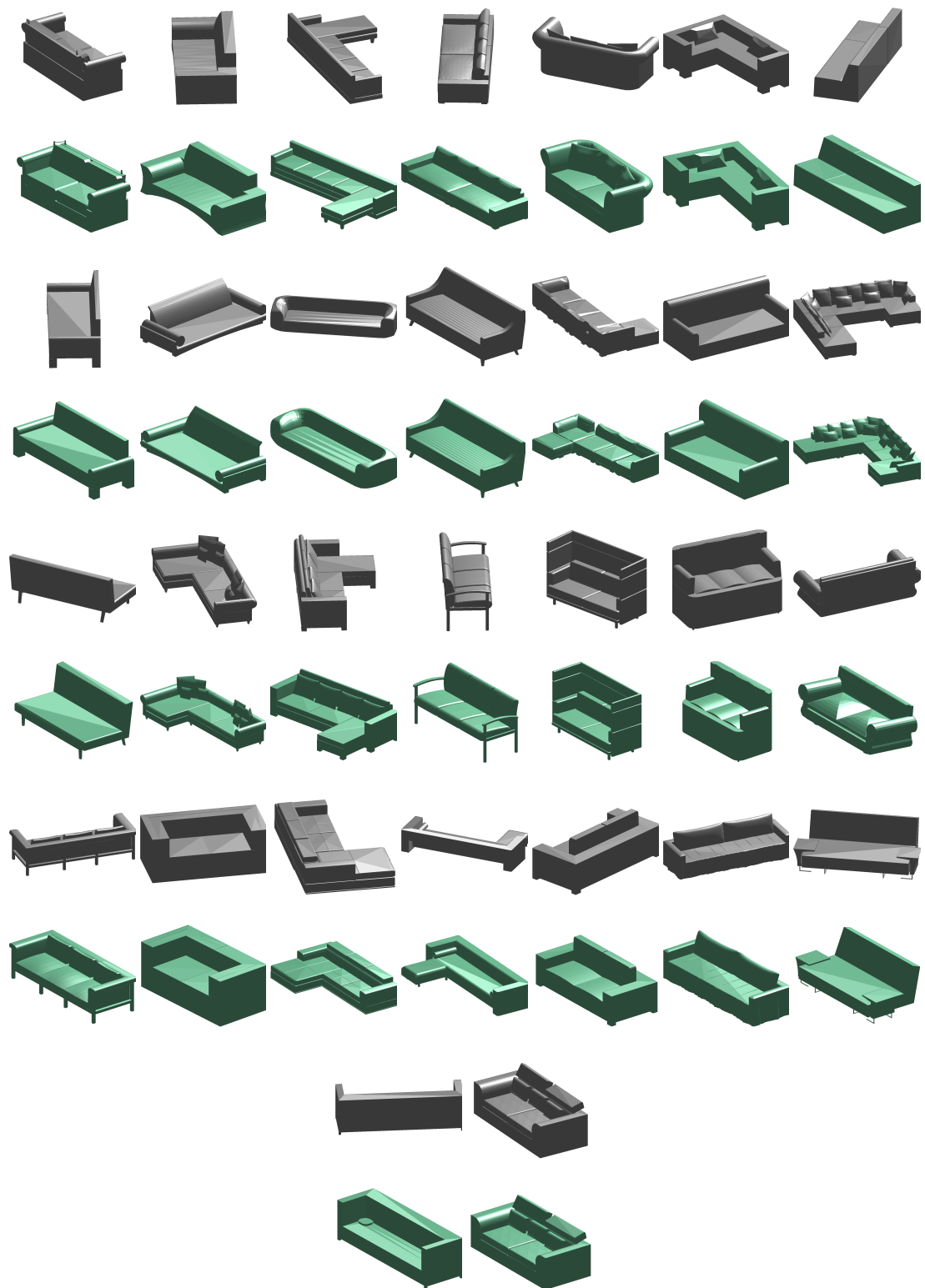


Figure A.15: Sofas dataset before (odd rows - in gray) and after (even rows - in green) alignment.

Appendix B

Template-based shape parameterization results

In this Appendix, we present the full set of results created by participants in our user study for evaluating our template-based shape parameterization method.

Full results for user experiments on Trimble 3D Warehouse datasets for our template-based parameterization method are presented in Figures B.1, B.2, B.3 (our method), and results from the user study comparing to Chaudhuri et al. [15] are presented in Figures B.7, B.9 (our method), and Figures B.8, B.10 (Chaudhuri et al. [15]).

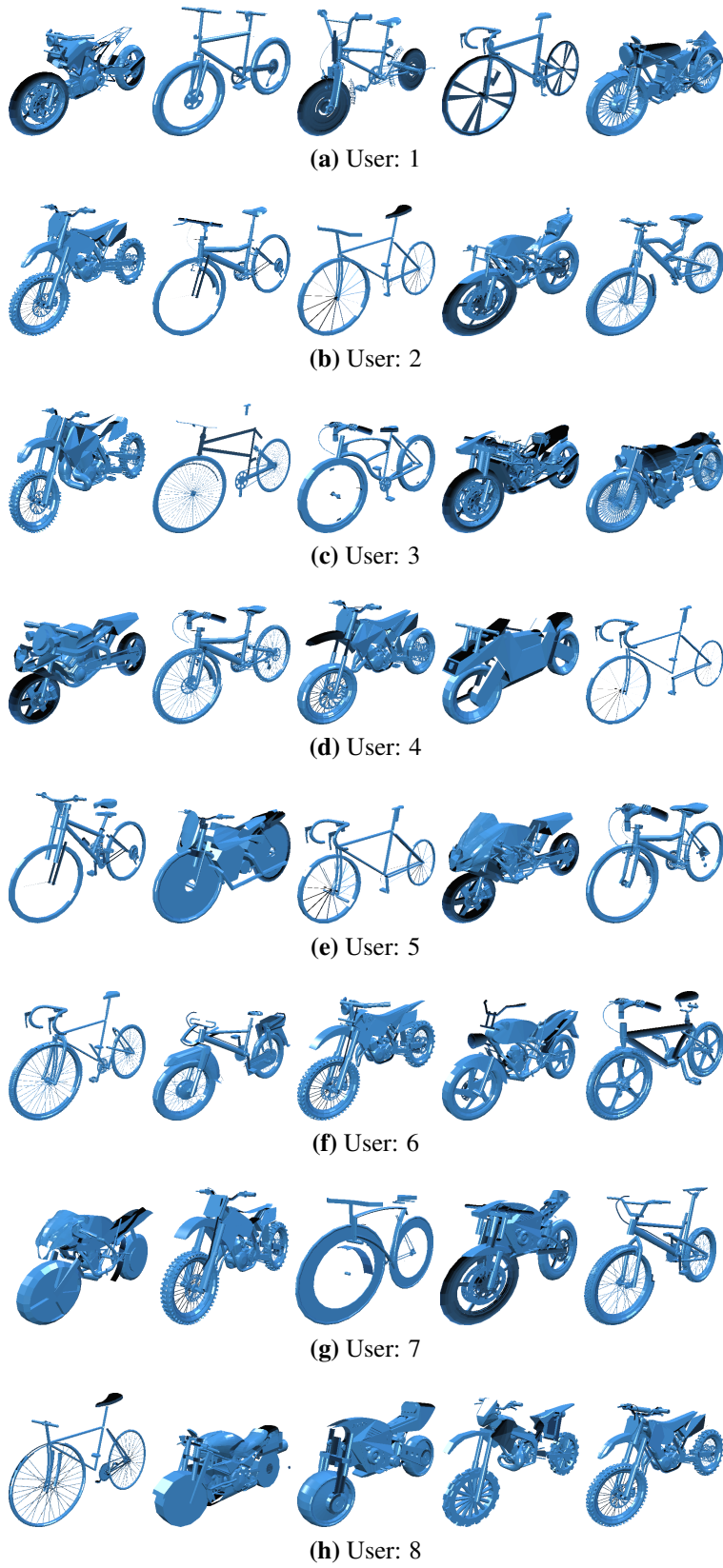
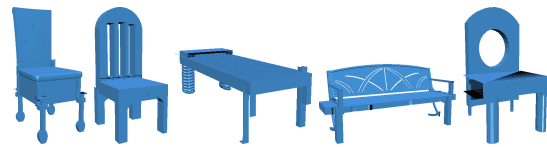


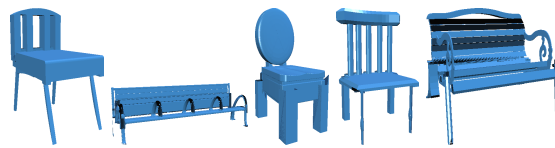
Figure B.1: Dataset: bike, Our method.



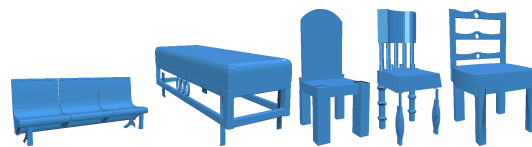
(a) User: 1



(b) User: 2



(c) User: 3



(d) User: 4



(e) User: 5



(f) User: 6



(g) User: 7



(h) User: 8

Figure B.2: Dataset: chair, Our method.

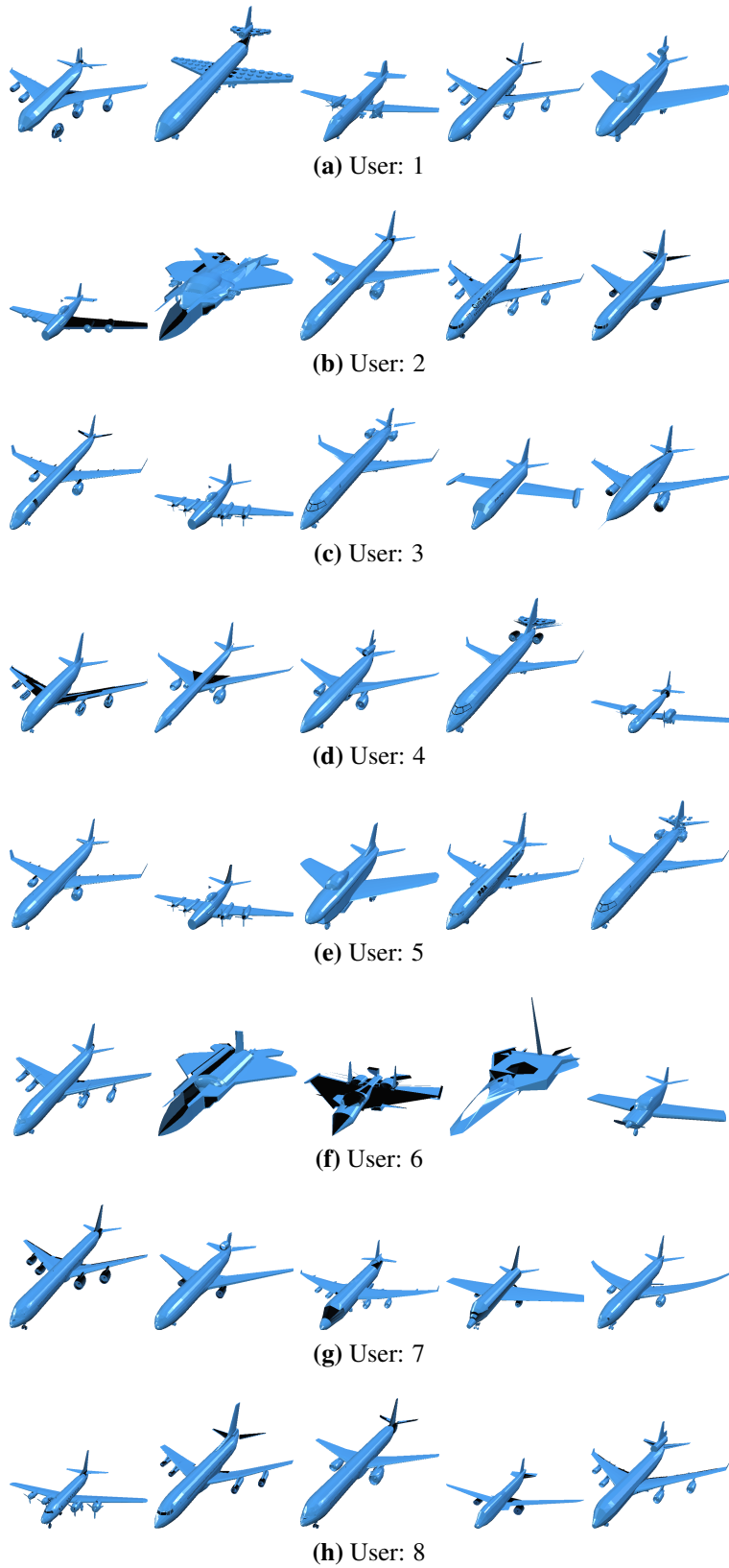
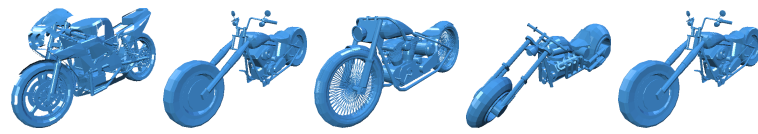
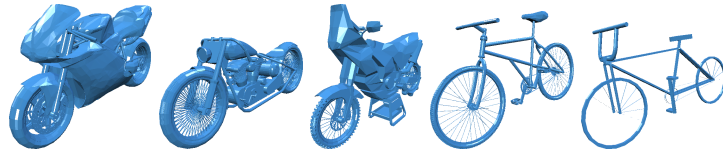


Figure B.3: Dataset: plane, Our method.



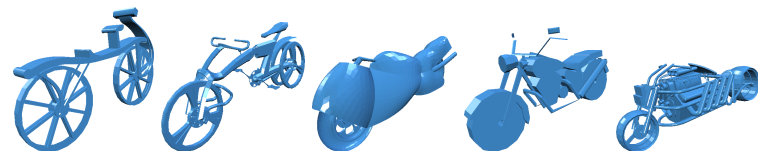
(a) Random Set: 1



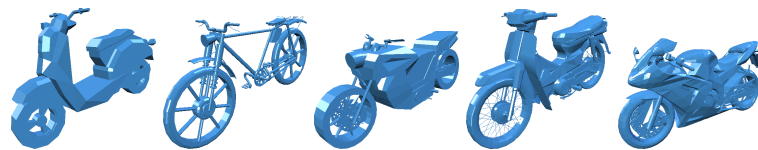
(b) Random Set: 2



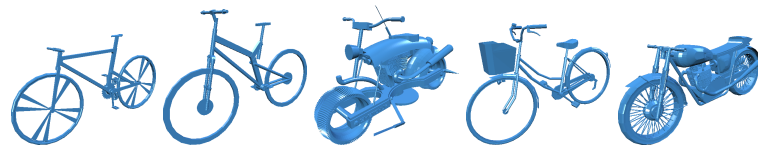
(c) Random Set: 3



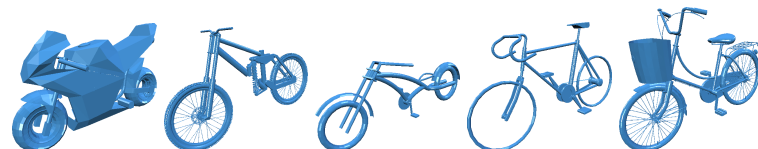
(d) Random Set: 4



(e) Random Set: 5



(f) Random Set: 6



(g) Random Set: 7



(h) Random Set: 8

Figure B.4: Dataset: bike, Baseline.



(a) Random Set: 1



(b) Random Set: 2



(c) Random Set: 3



(d) Random Set: 4



(e) Random Set: 5



(f) Random Set: 6



(g) Random Set: 7



(h) Random Set: 8

Figure B.5: Dataset: chair, Baseline.

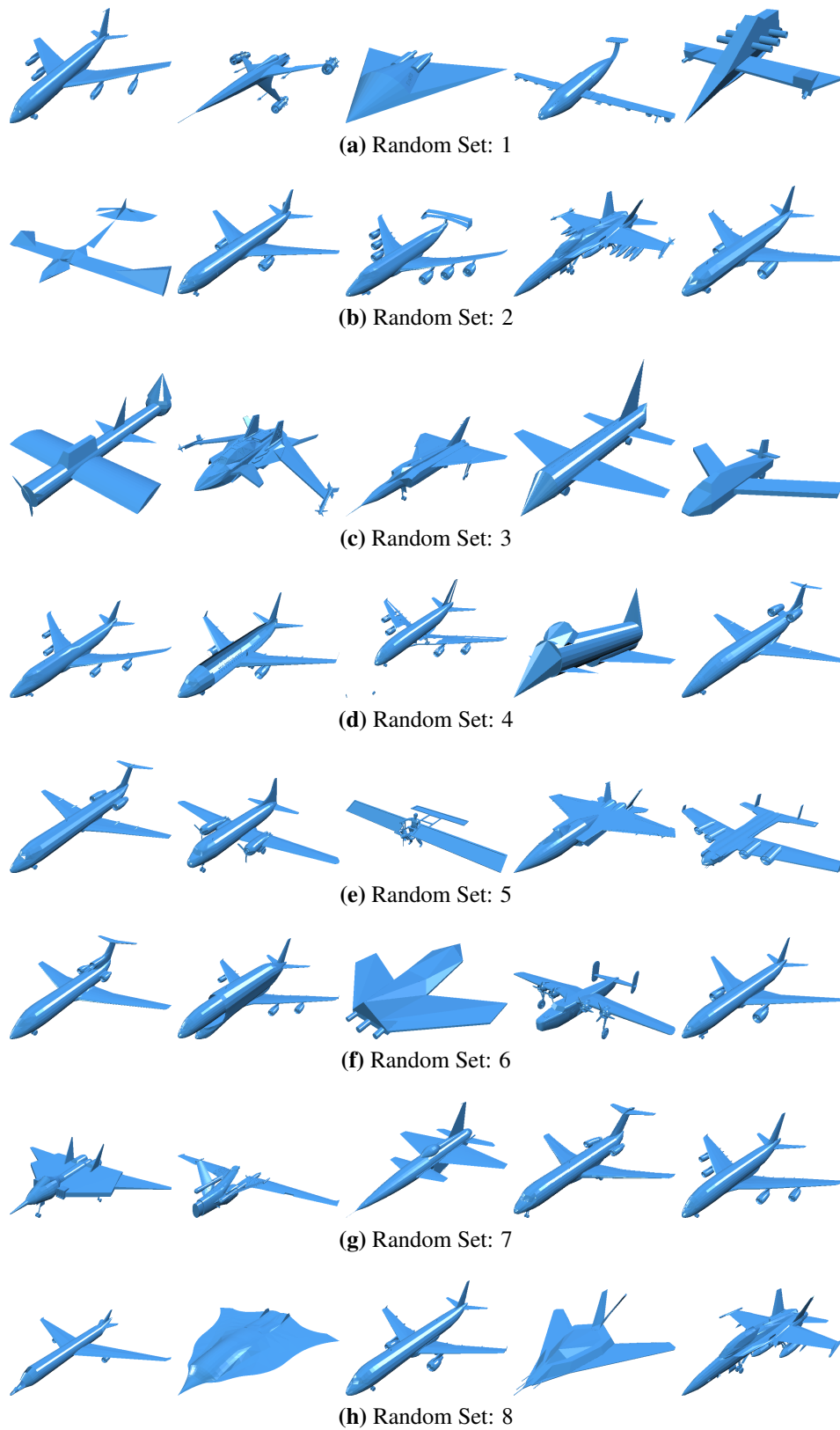


Figure B.6: Dataset: plane, Baseline.

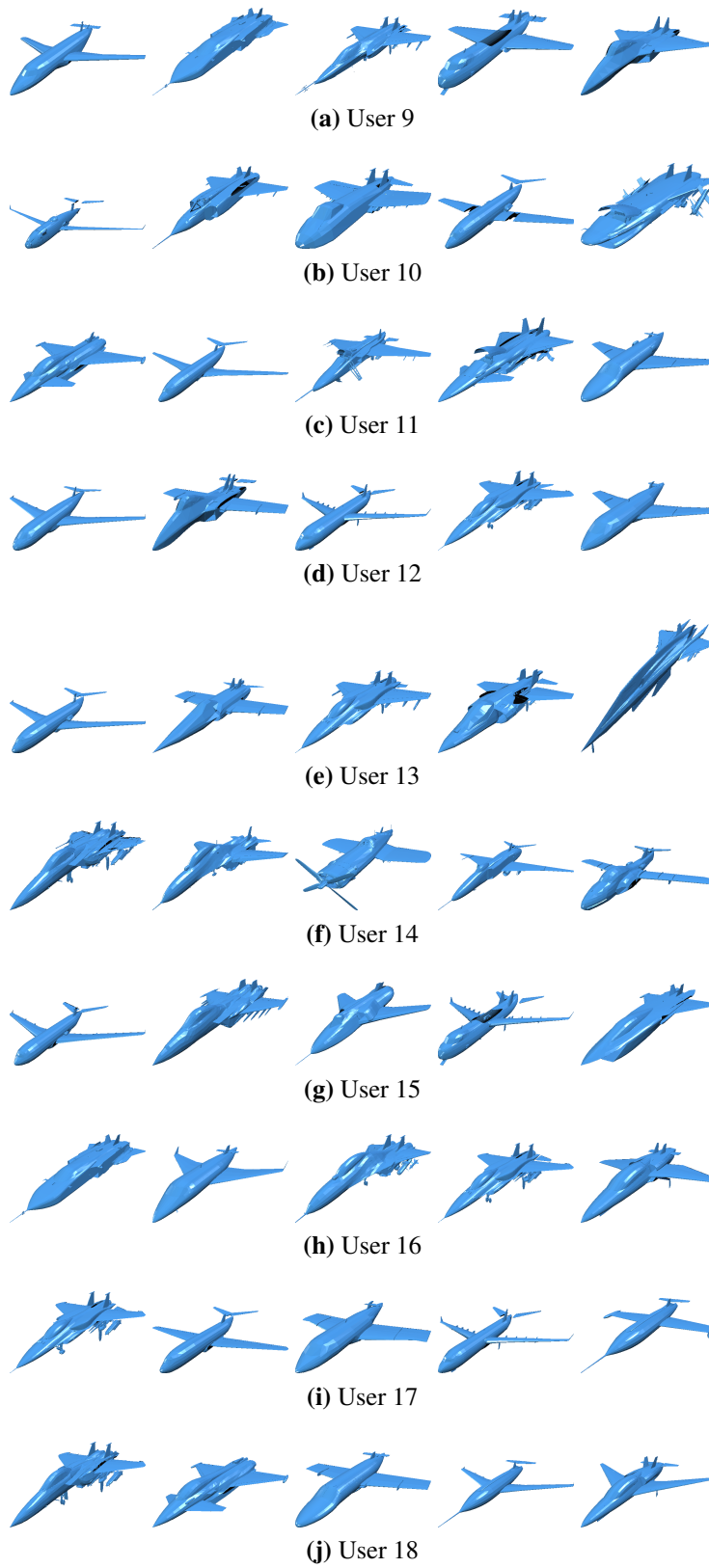


Figure B.7: Comparison: 100 airplanes, Task: **T1**, Method: Our method

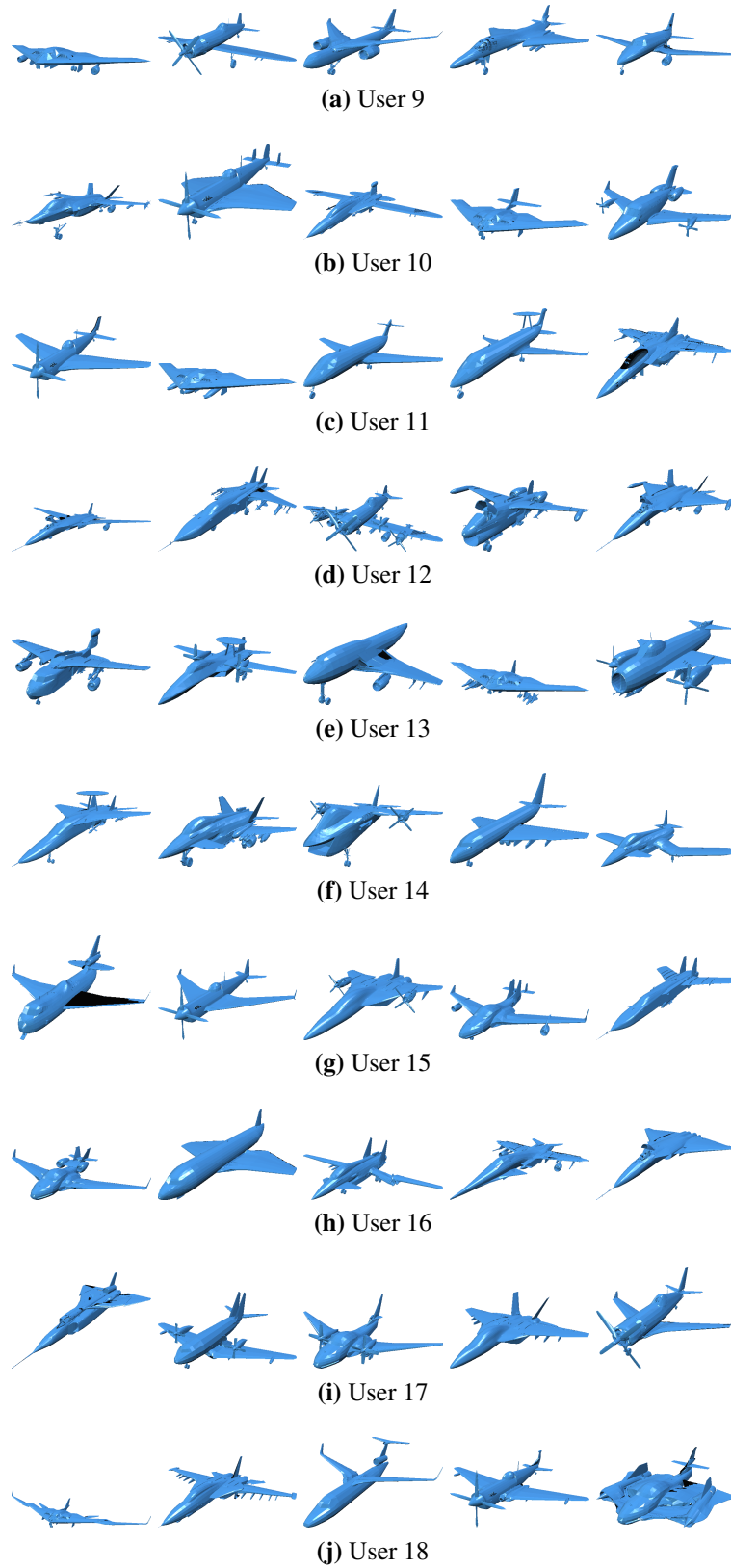


Figure B.8: Comparison: 100 airplanes, Task: **T1**, Method: Chaudhuri et al. [2011]

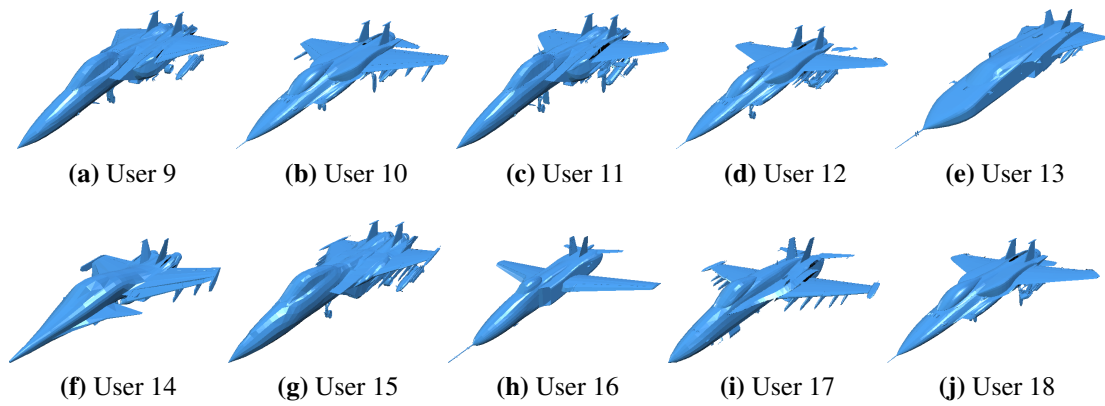


Figure B.9: Comparison: 100 airplanes, Task: **T2**, Method: Our method

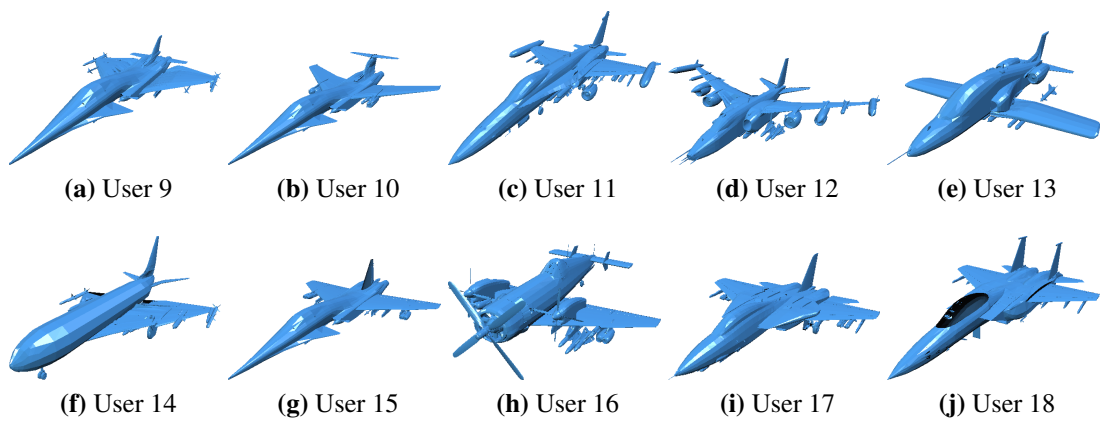


Figure B.10: Comparison: 100 airplanes, Task: **T2**, Method: Chaudhuri et al. [2011]