Compatible Intrinsic Triangulations – Supplementary Material

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1 EVALUATION WITH SCHMIDT ET AL. [2020]'S DATASET

Fig. 1 and Table 1 show the result of our method applied to Schmidt et al. [2020]'s dataset.

Table 1. Statistics of our evaluation with Schmidt et al. [2020]'s dataset. #**F** refers to the total number of triangles of the input triangle mesh pair, #**N** refers to the number of optimization steps taken, **T** refers to the total time taken for the optimization, and $\mathbf{E}_{\text{before}}$ and $\mathbf{E}_{\text{after}}$ refer to the mapping distortion before and after optimization, respectively.

Case name	#F	#N	T	$\mathbf{E}_{\text{before}}$	$\mathbf{E}_{\text{after}}$
Cow-Horse	10k	225	3.8h	11.6	4.73
Hands	32k	366	37.6h	13.2	4.35
Genus3	3k	440	2.9h	4.72	4.21
Genus5	8k	767	15.0h	5.44	4.49
Planes	25k	231	15.0h	13.1	4.35
Donut-Duck	24k	585	78.9h	11.5	4.68
Pretzel	12k	532	11.2h	6.55	5.25
Vase	10k	542	9.1h	10.4	4.60
Pig-Armadillo	22k	370	19.9h	11.3	8.10
Ant-Octopus	8k	4	1m	189.4	98.3

2 EVALUATION WITH PRINCETON SEGMENTATION DATASET

2.1 Method for generating random pairs

To generate random pairs of models, our basic idea is to shuffle the models by sorting them by SHA-256 hash values. The input to SHA-256 is the model ID as an ASCII string. For example, the first two bytes of SHA-256 of the model ID "1" is `6b86` (we only show the first two bytes hereafter). We use this value as a key to sort the models, and generate pairs of consecutive models after sorting.

For example, for the *Airplane* category, the top ten models in the SHA-256 sorted list are:

- `108c` ("65")
- `349c` ("78")
- `3ada` ("66")
- `4844` ("80")
- `49d1` ("67")
- `7f22` ("71")
- `81b8` ("62")
- `8722` ("72")
- `9606` ("73")
- `98a3` ("79")

where the number in each parenthesis denotes the model ID. Our pairs for this category are thus 65-78, 66-80, 67-71, 62-72, and 73-79.

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Note that there are some categories where we exclude some models and do additional grouping based on the characteristic of the models. See below for individual explanations.

2.2 *Human* category

This category is rather exceptional and needed special treatment to create pairs in a meaningful way. First, we excluded scanned models where the arms are glued to the torso or the legs (16 and 18). We then excluded severely noise-laden scanned models (5, 13, 17, 19, and 20) where geometries are not sufficiently resolved, especially near hands and feet. We also excluded two artist-created models (9 and 12) because their resolutions were too low.

Four artist-created models (1, 7, 8, and 11) had too few triangles near hands and feet, so we replaced those parts with round blobs with regular remeshing. We created two pairs in this group: 1-7 and 8-11.

There are two scanned models (2 and 10) that are sufficiently cleanly captured, so we paired them: 2-10.

The rest are five artist-created models (3, 4, 6, 14, and 15) with their fingers cleanly separated and triangulated. We created two pairs 3-4 and 6-14 in this group.

Fig. 2 and Table 2 show the result of our method applied to these pairs. Hereafter, the notation in the figure and in the table is the same as in Fig. 1 and in Table 1).

Table 2. Statistics of our evaluation with the *Human* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	$\mathbf{E}_{\text{before}}$	$\mathbf{E}_{\text{after}}$
1-7	27k	36	3.6h	6.78	5.92
2-10	39k	162	55.2h	5.03	4.22
3-4	22k	120	11.1h	4.36	4.15
6-14	27k	21	4.4h	10.8	9.39
8-11	28k	254	16.6h	7.76	4.81

2.3 *Cup* category

In this category, there are four genus 0 models (25, 30, 35 and 40). 25 and 40 look more like cylinders while 30 and 35 look more like wine glasses, so we paired them: 25-40 and 35-30.

For the rest of the models, the top six in the SHA-256 sorted list are:

- `0b91` ("39")
- `3513` ("29")
- `535f` ("23")
- `59e1` ("28")
- `5f9c` ("26")
- `6706` ("27")

resulting in three pairs: 39-29, 23-28, and 26-27.

Fig. 3 and Table 3 show the result of our method applied to these pairs.

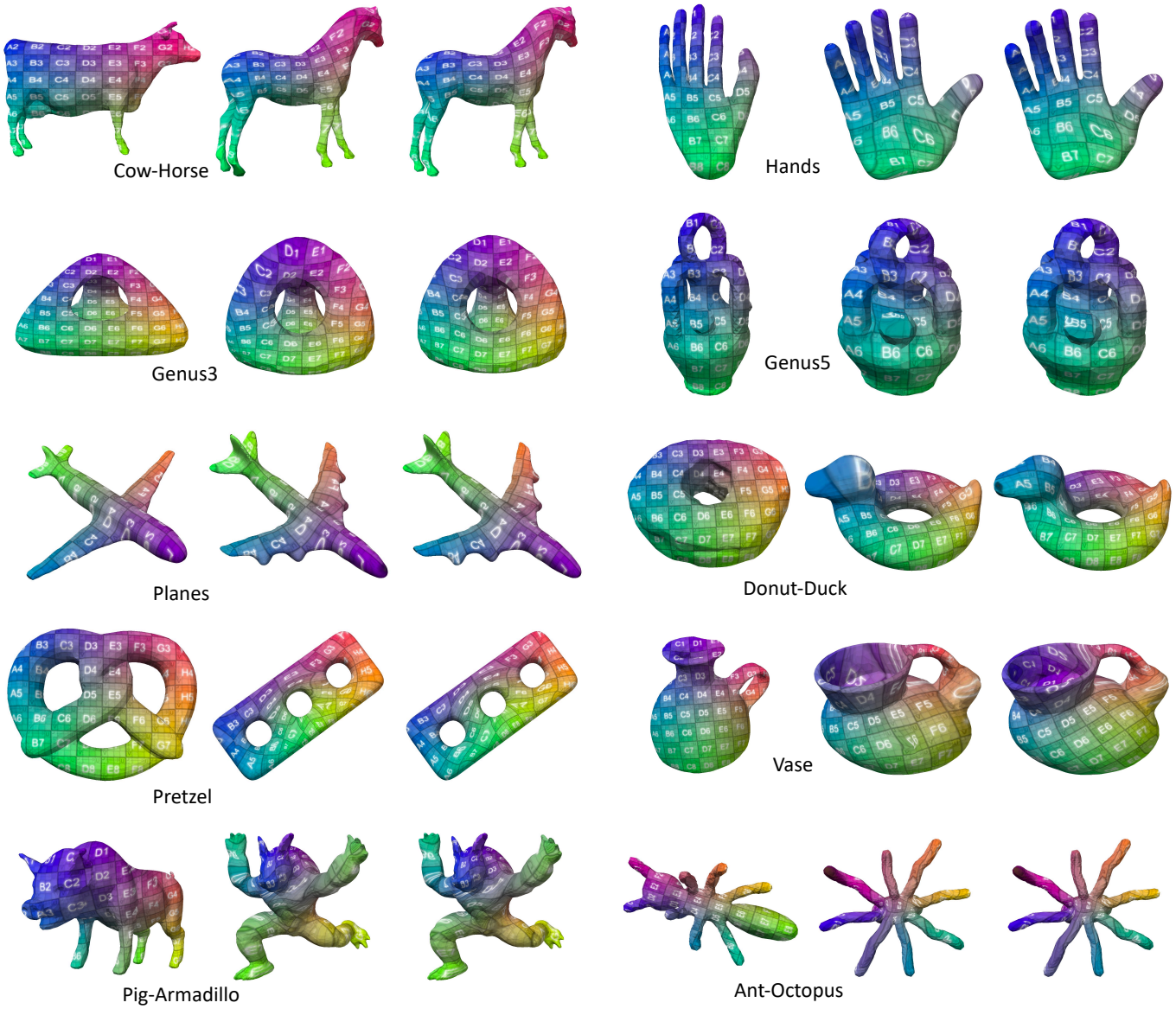

Fig. 1. Visualization of surface mappings before and after optimization for the models in Schmidt et al. [2020]'s dataset. In each case, on the left is one model with predefined UV coordinates (generated via projection to 2D from a certain viewpoint), which gets mapped to the other model as shown on the center (before optimization) and on the right (after optimization).

Table 3. Statistics of our evaluation with the *Cup* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
23-28	30k	450	36.7h	4.28	4.08
25-40	31k	540	82.8h	6.28	4.09
26-27	30k	359	78.3h	4.63	4.11
30-35	25k	662	89.3h	6.91	4.26
39-29	36k	303	64.8h	8.97	4.34

2.4 *Glasses* category

The model 49 has a small handle, making its genus one, so we excluded it. For the rest of the models, the top ten in the SHA-256 sorted list are:

- `02d2` ("55")
- `031b` ("51")
- `1a65` ("50")
- `25fc` ("46")
- `2858` ("53")
- `2fca` ("54")

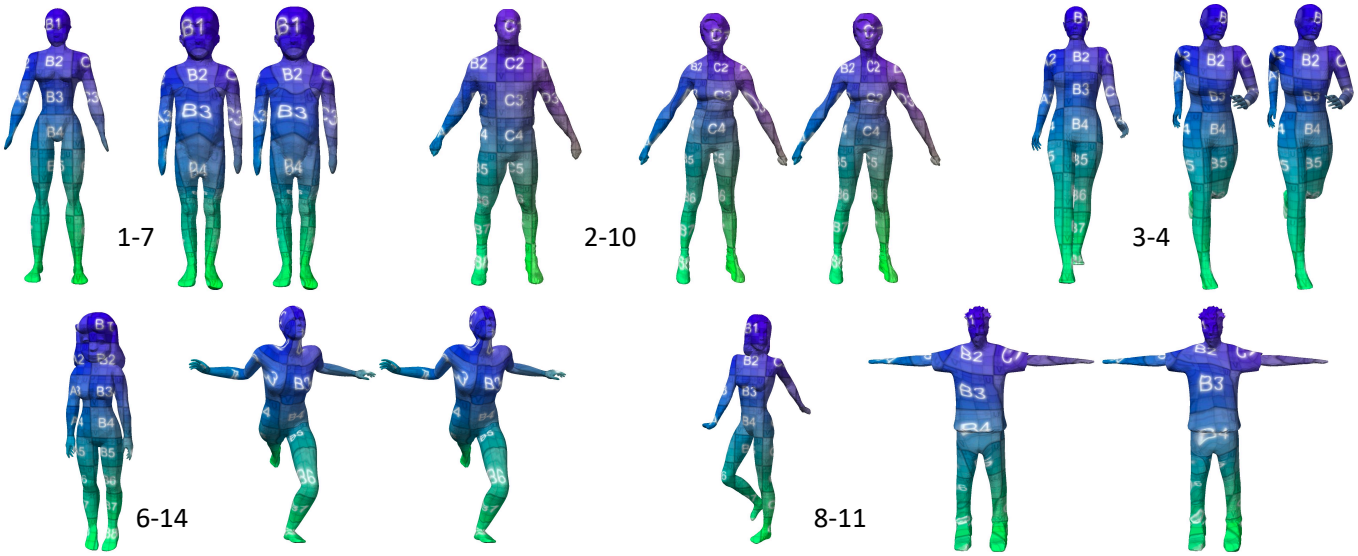

Fig. 2. Result of our method applied to the *Human* category in the Princeton Segmentation dataset.

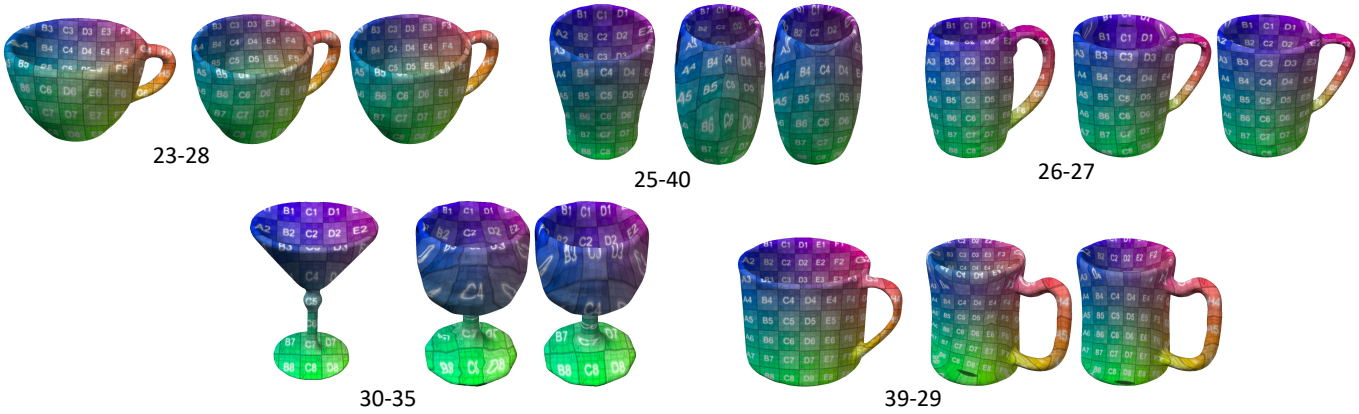

Fig. 3. Result of our method applied to the *Cup* category in the Princeton Segmentation dataset.

Fig. 4. Result of our method applied to the *Glasses* category in the Princeton Segmentation dataset.

Table 4. Statistics of our evaluation with the *Glasses* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
47-60	8.8k	233	3.4h	4.67	4.12

- 3148 (“47”)
- 39fa (“60”)
- 3d91 (“41”)
- 3e1e (“59”)

resulting in five pairs: 55-51, 50-46, 53-54, 47-60, and 41-59. As noted in the main text, all of these pairs except 47-60 caused HOT to fail. Fig. 4 and Table 4 show the result of our method applied to the pair 47-60.

2.5 *Airplane* category

This category needs no exclusion nor further grouping, and the way pairs are formed is already described in Section 2.1. As noted in the main text, our CIT generation algorithm failed for the pair 62-72. Fig. 5 and Table 5 show the result of our method applied to the remaining four pairs.

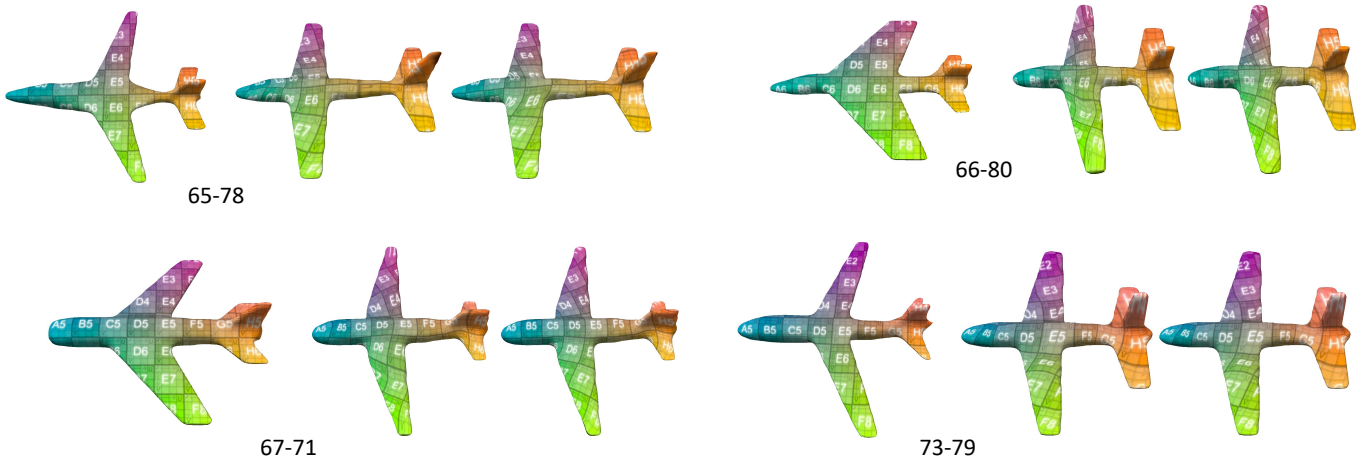

Fig. 5. Result of our method applied to the *Airplane* category in the Princeton Segmentation dataset.

Table 5. Statistics of our evaluation with the *Airplane* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
65-78	28k	235	41.8h	7.27	4.69
66-80	30k	262	56.8h	7.08	5.35
67-71	27k	246	43.7h	5.18	4.22
73-79	24k	82	7.55h	6.12	5.71

Table 6. Statistics of our evaluation with the *Ant* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
81-90	28k	216	21.9h	6.17	4.27
86-84	28k	445	75.9h	8.36	4.31
88-99	30k	225	51.0h	6.11	4.60
91-98	30k	208	38.5h	8.04	4.67
96-92	29k	390	66.5h	11.76	5.46

2.6 *Ant* category

The model 93 has a small handle, making its genus one, so we excluded it. For the rest of the models, the top ten in the SHA-256 sorted list are:

- 1da5 (“91”)
- 29db (“98”)
- 434c (“86”)
- 44c8 (“84”)
- 5316 (“81”)
- 69f5 (“90”)
- 7b1a (“96”)
- 8241 (“92”)
- 8b94 (“88”)
- 8c1f (“99”)

resulting in five pairs: 91-98, 86-84, 81-90, 96-92, and 88-99. Fig. 6 and Table 6 show the result of our method applied to these pairs.

2.7 *Chair* category

We excluded 113 and 107 because their genus (2 and 4, respectively) are different from any other models in the category. We also excluded 109 and 114 because they have too thin parts which would be too challenging for SSM to handle. There are four models of genus 3, and their SHA-256 sorted list is:

- 1253 (“105”)
- 3783 (“102”)
- 9537 (“108”)
- 9bdb (“110”)

resulting in two pairs: 105-102 and 108-110. For the rest of the models, the top six in the SHA-256 sorted list are:

- 16dc (“101”)
- 28da (“115”)
- 2aba (“120”)
- 2ac8 (“117”)
- 3038 (“119”)
- 454f (“103”)

resulting in three pairs: 101-115, 120-117, and 119-103. Fig. 7 and Table 7 show the result of our method applied to these pairs.

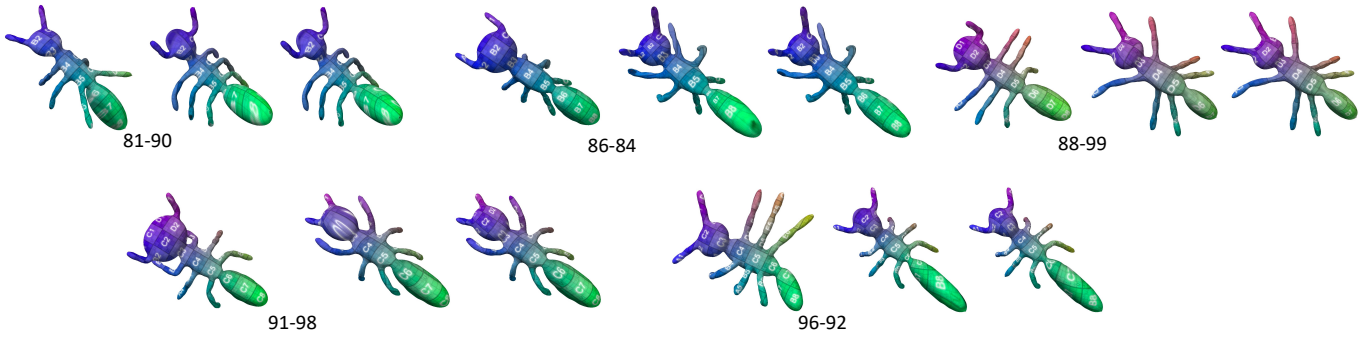

Fig. 6. Result of our method applied to the *Ant* category in the Princeton Segmentation dataset.

Fig. 7. Result of our method applied to the *Chair* category in the Princeton Segmentation dataset.

Table 7. Statistics of our evaluation with the *Chair* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
101-115	37k	344	90.4h	6.55	4.53
105-102	50k	260	117h	11.2	4.67
108-110	38k	11	2.1h	5.41	5.33
119-103	44k	253	87.4h	7.40	4.37
120-117	49k	227	127h	6.77	4.36

2.8 *Octopus* category

The model 121 has a small handle, making its genus one, so we excluded it. We also excluded the model 125 because it has only three tentacles. For the rest of the models, the top ten in the SHA-256 sorted list are:

- `1367` (“135”)
- `1be0` (“122”)
- `2747` (“128”)
- `36eb` (“136”)

Fig. 8. Result of our method applied to the *Octopus* category in the Princeton Segmentation dataset.

- `38d6` (“130”)
- `5d38` (“134”)
- `6566` (“129”)
- `65a6` (“126”)
- `6aff` (“124”)
- `8d27` (“139”)

resulting in five pairs: 135-122, 128-136, 130-134, 129-126, and 124-139. As noted in the main text, all of these pairs except 135-122 caused our CIT generation algorithm to fail. Fig. 8 and Table 8 show the result of our method applied to the pair 135-122.

Table 8. Statistics of our evaluation with the *Octopus* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
135-122	30k	17	12.7h	113.2	22.1

2.9 *Table* category

We excluded 150 because it is the only model with three legs. There are two models with eight legs, so we paired them: 142-148. For the rest of the models, the top eight in the SHA-256 sorted list are:

- `0430` ("152")
- `05ad` ("149")
- `0a5b` ("146")
- `0fec` ("156")
- `1d0e` ("154")
- `1d28` ("147")
- `210e` ("155")
- `2c7d` ("141")

resulting in four pairs: 152-149, 146-156, 154-147, and 155-141. As noted in the main text, HOT failed for the pair 146-156 while our CIT generation algorithm failed for the pair 152-149. Fig. 9 and Table 9 show the result of our method applied to the remaining three pairs.

Table 9. Statistics of our evaluation with the *Table* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
142-148	23k	278	20.1h	6.03	4.70
154-147	28k	223	38.5h	5.77	4.72
155-141	28k	381	67.9h	6.11	4.49

2.10 *Teddy* category

The model 163 has a small handle, making its genus one, so we excluded it. For the rest of the models, the top ten in the SHA-256 sorted list are:

- `01d5` ("178")
- `284d` ("171")
- `3068` ("179")
- `3f98` ("164")
- `41e5` ("174")
- `4a85` ("173")
- `6851` ("172")
- `734d` ("170")
- `73d3` ("167")
- `79d6` ("162")

resulting in five pairs: 178-171, 179-164, 174-173, 172-170, and 167-162. Fig. 10 and Table 10 show the result of our method applied to these pairs.

Table 10. Statistics of our evaluation with the *Teddy* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
167-162	22k	702	63.1h	5.40	4.32
172-170	26k	497	57.7h	7.81	4.71
174-173	31k	293	62.7h	5.30	4.08
178-171	31k	365	69.0h	7.08	4.42
179-164	32k	227	44.5h	174.4	4.24

2.11 *Hand* category

The model 187 has a small handle, making its genus one, so we excluded it. We also excluded the models 182, 191, and 198 because their middle and ring fingers are severely fused. For the rest of the models, the top ten in the SHA-256 sorted list are:

- `1dfa` ("195")
- `2397` ("190")
- `27ba` ("200")
- `2811` ("186")
- `52f1` ("184")
- `5808` ("181")
- `5a39` ("199")
- `61a2` ("185")
- `684f` ("193")
- `7045` ("189")

resulting in five pairs: 195-190, 200-186, 184-181, 199-185, and 193-189. Fig. 11 and Table 11 show the result of our method applied to these pairs.

Table 11. Statistics of our evaluation with the *Hand* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
184-181	24k	466	33.7h	5.24	4.28
193-189	22k	327	28.1h	5.43	4.37
195-190	32k	296	66.3h	5.35	4.10
199-185	22k	951	55.5h	12.8	4.35
200-186	16k	788	30.0h	5.11	4.15

2.12 *Plier* category

This category needs no exclusion nor further grouping, and the top ten in the SHA-256 sorted list are:

- `0934` ("211")
- `0f41` ("216")
- `16ba` ("217")
- `314f` ("219")
- `3679` ("220")
- `4397` ("201")
- `4621` ("203")
- `5966` ("218")
- `5cf4` ("206")
- `802b` ("214")

Fig. 9. Result of our method applied to the *Table* category in the Princeton Segmentation dataset.

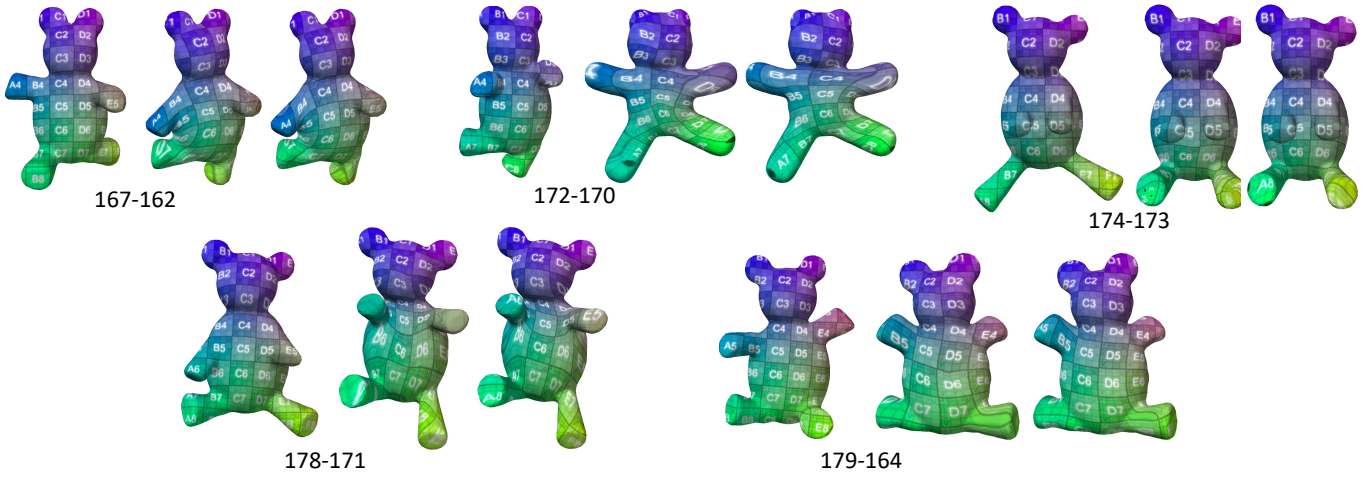

Fig. 10. Result of our method applied to the *Teddy* category in the Princeton Segmentation dataset.

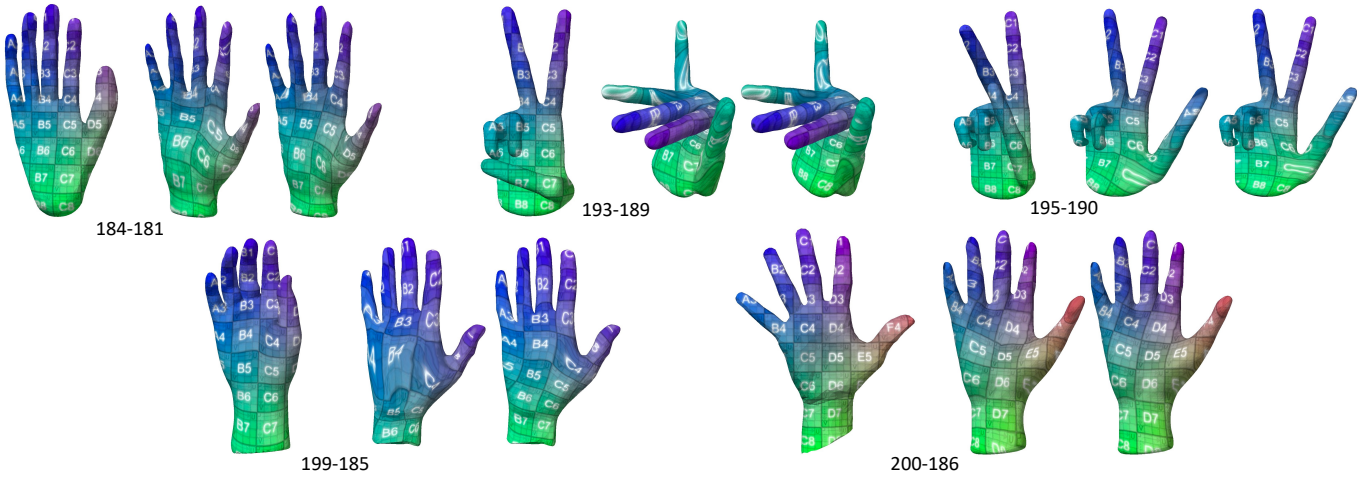

Fig. 11. Result of our method applied to the *Hand* category in the Princeton Segmentation dataset.

resulting in five pairs: 211-216, 217-219, 220-201, 203-218, and 206-214. As noted in the main text, our CIT generation algorithm failed for the pair 220-201. Fig. 12 and Table 12 show the result of our method applied to the remaining four pairs.

Table 12. Statistics of our evaluation with the *Plier* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
203-218	20k	174	13.1h	4.53	4.14
206-214	17k	537	33.0h	5.44	4.43
211-216	18k	175	9.5h	4.83	4.10
217-219	18k	122	6.4h	40.34	9.50

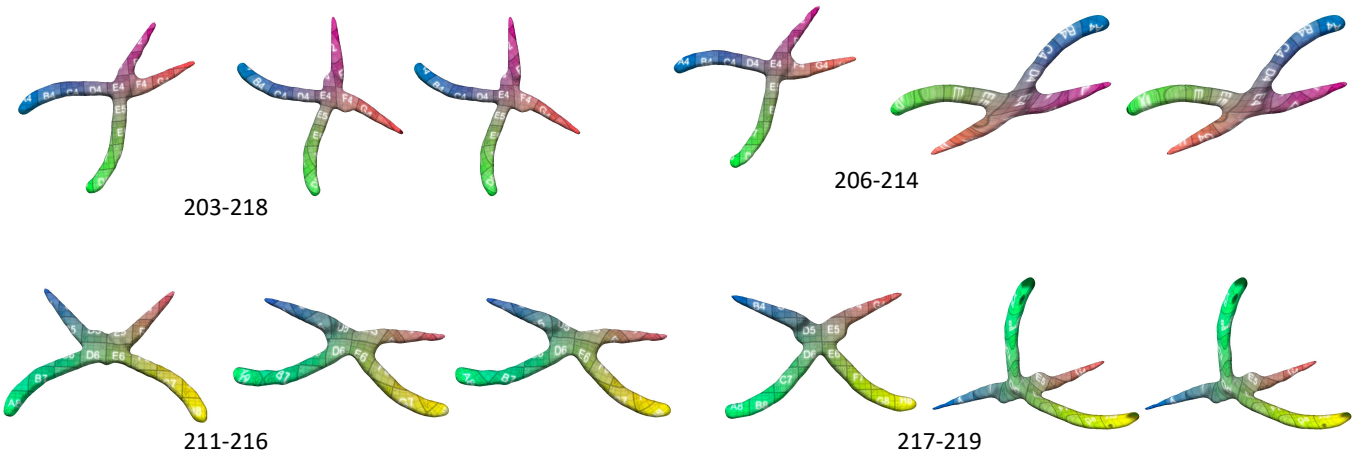

Fig. 12. Result of our method applied to the *Plier* category in the Princeton Segmentation dataset.

2.13 *Fish* category

This category needs no exclusion nor further grouping, and the top ten in the SHA-256 sorted list are:

- `0849` (“229”)
- `0a2d` (“235”)
- `0e65` (“225”)
- `114b` (“234”)
- `138d` (“231”)
- `56f4` (“223”)
- `67e9` (“221”)
- `6af1` (“240”)
- `79bf` (“239”)
- `835d` (“232”)

resulting in five pairs: 229-235, 225-234, 231-223, 221-240, and 239-232. Fig. 13 and Table 13 show the result of our method applied to these pairs.

Table 13. Statistics of our evaluation with the *Fish* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
221-240	28k	252	19.9h	6.35	4.42
225-234	27k	114	12.2h	6.51	5.11
229-235	21k	429	27.7h	5.66	4.47
231-223	26k	301	40.0h	5.50	4.44
239-232	21k	41	2.5h	8.07	7.01

2.14 *Bird* category

The models 257 and 258 contain extremely thin wings which would be difficult for HOT to handle, so we excluded them. For the rest of the models, the top ten in the SHA-256 sorted list are:

- `011a` (“245”)
- `1406` (“242”)
- `1e47` (“250”)
- `37c2` (“246”)
- `396f` (“247”)
- `39bb` (“260”)
- `51e8` (“256”)
- `7244` (“243”)
- `749f` (“241”)
- `766c` (“248”)

resulting in five pairs: 245-242, 250-246, 247-260, 256-243, and 241-248. Fig. 14 and Table 14 show the result of our method applied to these pairs.

Table 14. Statistics of our evaluation with the *Bird* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
241-248	31k	11	1.96h	9.77	9.52
245-242	29k	249	46.1h	4.34	4.05
247-260	24k	328	42.9h	12.39	5.04
250-246	17k	84	3.5h	9.01	6.56
256-243	18k	382	12.0h	12.15	5.45

2.15 *Armadillo* category

We excluded the models 292, 294, 295, 296, 297, and 299 because some of their body parts are amputated in a unique way, making it difficult to define a meaningful mapping with other models. We grouped the models 293, 298, and 300 because they have in common that their ears are missing; their SHA-256 sorted list is:

- `76eb` (“298”)
- `7cb6` (“293”)
- `983b` (“300”) resulting in a pair 298-293.

For the rest of the models, the top eight in the SHA-256 sorted list are:

- `0032` (“286”)
- `0989` (“290”)
- `1e68` (“284”)
- `23c6` (“288”)

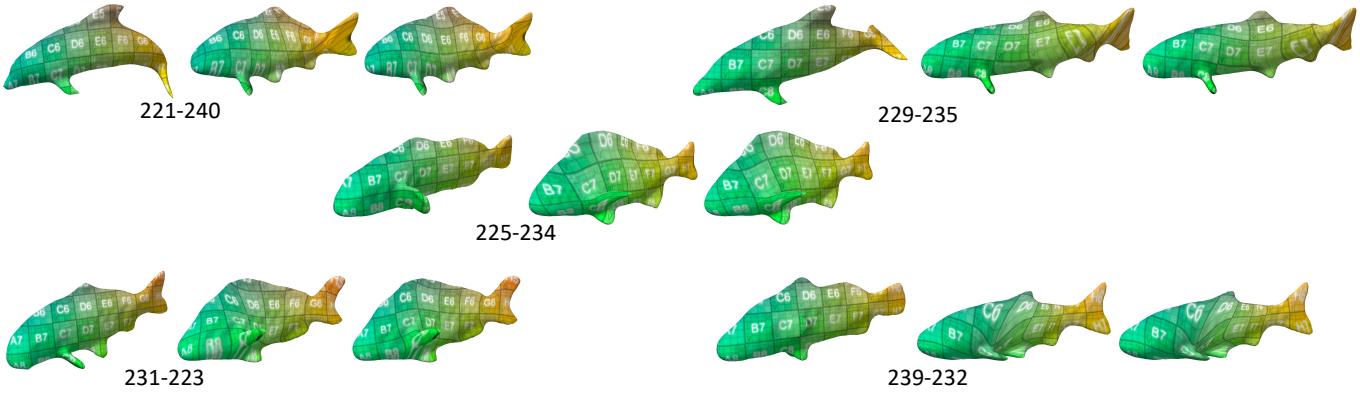

Fig. 13. Result of our method applied to the *Fish* category in the Princeton Segmentation dataset.

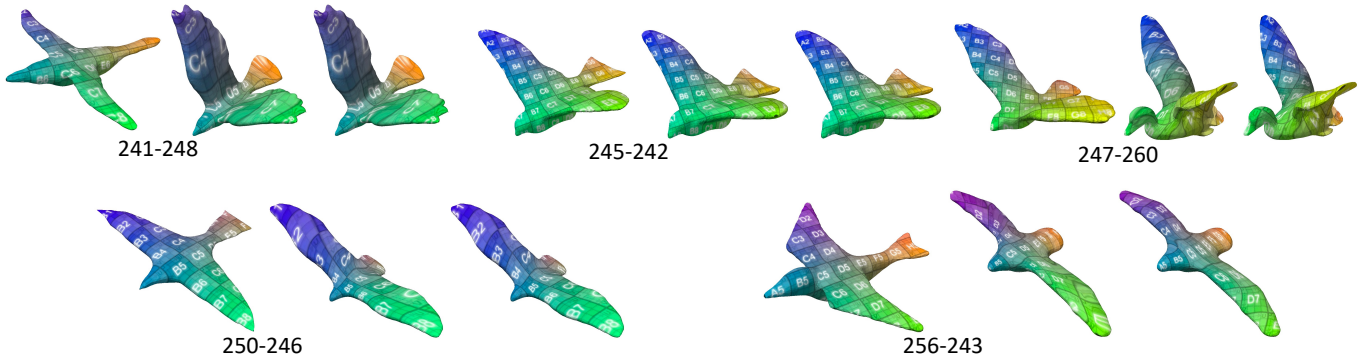

Fig. 14. Result of our method applied to the *Bird* category in the Princeton Segmentation dataset.

- `27e1` (“282”)
- `3351` (“291”)
- `71a1` (“281”)
- `a0d1` (“285”)

resulting in four pairs: 286-290, 284-288, 282-291, and 281-285. Fig. 15 and Table 15 show the result of our method applied to these pairs.

Table 15. Statistics of our evaluation with the *Armadillo* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
281-285	39k	323	95.4h	5.50	4.30
282-291	49k	46	26.9h	5.97	5.12
284-288	38k	319	70.9h	4.97	4.16
286-290	26k	263	14.5h	6.52	4.70
298-293	29k	51	8.2h	6.28	5.24

2.16 *Bust* category

This category contains quite a variety of geometries that make it non-trivial to form meaningful pairs. First, we excluded five models (302, 305, 311, 319, and 320) containing unique parts (e.g. hats, scarfs, base) that make it difficult to define a meaningful mapping with other models. We then further grouped the remaining 15 models into five sub-categories and created a pair in each.

The first sub-category is for models depicting a man’s head whose back side is cut off by a plane (315, 316, and 318). Because 315 and 316 seem to represent the same person, we chose to pair 315 and 318.

The second sub-category is for models whose bottom part below the neck is carved out (301, 304, and 317). Their SHA-256 sorted list is:

- `8d1e` (“317”)
- `c3ea` (“301”)
- `d874` (“304”)

resulting in a pair 317-301.

The third sub-category is for models whose part below the shoulder is cut off by a plane or a curved surface (303, 312, 313, and 314). Their SHA-256 sorted list is:

- `7480` (“314”)
- `8657` (“312”)
- `8bd9` (“303”)
- `8efb` (“313”)

resulting in a pair 314-312.

The fourth sub-category is for models depicting a child’s head and shoulder (306, 307, and 308). Their SHA-256 sorted list is:

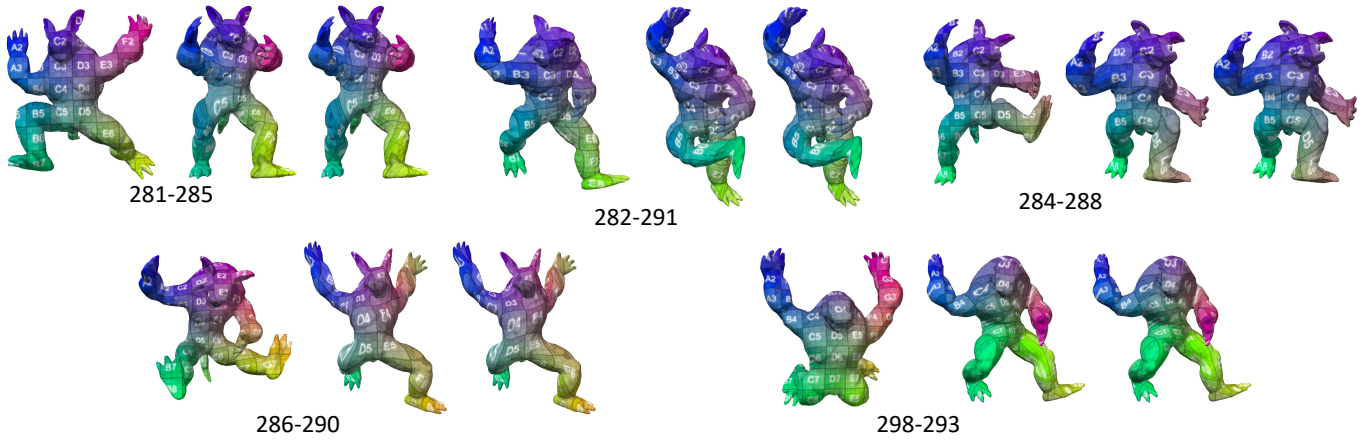

Fig. 15. Result of our method applied to the *Armadillo* category in the Princeton Segmentation dataset.

- 38b8 (“306”)
- 48a1 (“308”)
- 6d97 (“307”)

resulting in a pair 306-308.

The last sub-category is for models depicting a human head in full (309 and 310). Fig. 16 and Table 16 show the result of our method applied to these pairs.

Table 16. Statistics of our evaluation with the *Bust* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
306-308	25k	796	52.6h	6.66	4.47
310-309	27k	183	30.9h	8.91	5.49
314-312	27k	364	37.0h	8.74	4.83
315-318	30k	1069	139.0h	6.90	4.24
317-301	27k	1570	188.4h	10.86	4.78

2.17 *Mech* category

We excluded the models 326 and 337 because it was unclear how to make correspondence with the other models which have in common that the geometry consists of a cube-like base and a small part sitting on top of it. The top ten in the SHA-256 sorted list of the remaining eighteen models are:

- 02cc (“327”)
- 058d (“334”)
- 0791 (“329”)
- 0bba (“331”)
- 1038 (“324”)
- 2452 (“328”)
- 3949 (“323”)
- 5426 (“330”)
- 556d (“333”)
- 5d8f (“338”)

resulting in five pairs: 327-334, 329-331, 324-328, 323-330, and 333-338. Fig. 17 and Table 17 show the result of our method applied to these pairs.

Table 17. Statistics of our evaluation with the *Mech* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
323-330	30k	35	7.7h	4.19	4.12
324-328	30k	417	116.3h	6.80	4.29
327-334	15k	510	22.4h	4.46	4.04
329-331	16k	383	23.5h	4.55	4.10
333-338	27k	482	93.3h	5.41	4.19

2.18 *Bearing* category

We excluded the model 357 because it is the only one with genus six. The models 358 and 359 are the only ones of genus four. Even though they seem to represent an identical geometry, their meshes are not identical with different number of triangles, so we included the pair in our evaluation as a robustness test. For the rest of the models, the top eight in the SHA-256 sorted list are:

- 0238 (“342”)
- 02e6 (“344”)
- 03a3 (“356”)
- 04a8 (“351”)
- 06b2 (“348”)
- 09a1 (“354”)
- 2289 (“347”)
- 355d (“355”)

resulting in four pairs: 342-344, 356-351, 348-354, and 347-355. Fig. 18 and Table 18 show the result of our method applied to these pairs.

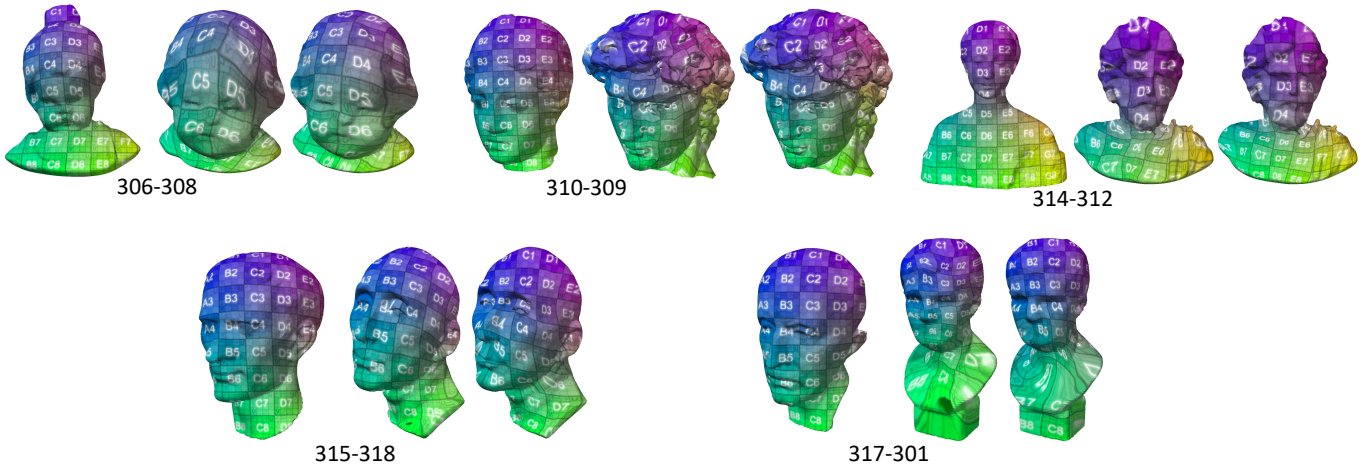

Fig. 16. Result of our method applied to the *Bust* category in the Princeton Segmentation dataset.

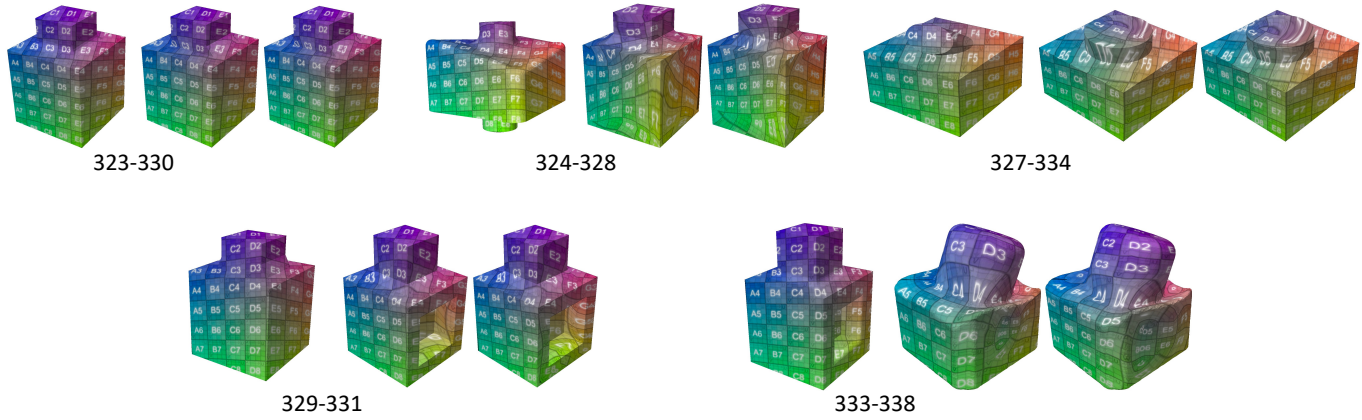

Fig. 17. Result of our method applied to the *Mech* category in the Princeton Segmentation dataset.

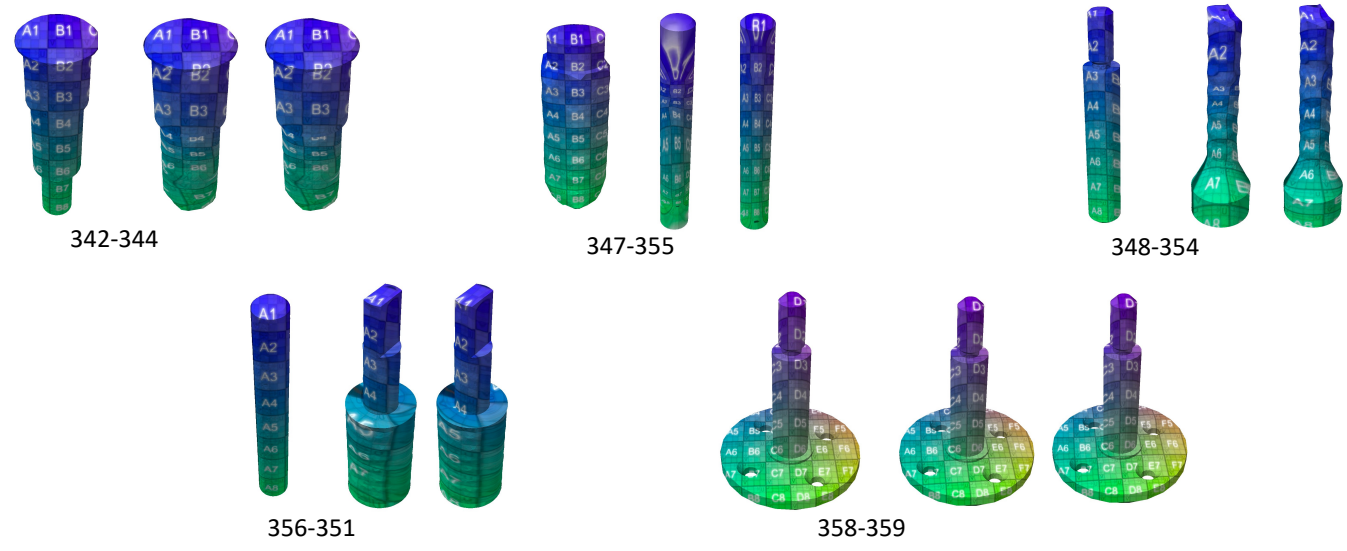

Fig. 18. Result of our method applied to the *Bearing* category in the Princeton Segmentation dataset.

Table 18. Statistics of our evaluation with the *Bearing* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
342-344	15k	61	3.6h	6.68	5.74
347-355	13k	321	12.7h	40.67	5.64
348-354	13k	386	15.4h	6.42	4.55
356-351	13k	558	32.5h	6.84	5.02
358-359	30k	7	8.4h	4.07	4.06

2.19 *Vase* category

This category contains quite a variety of geometries that make it non-trivial to form meaningful pairs. First, we excluded the model 361 because it is the only one with genus five. Two models 364 and 377 are the only ones with genus two, but their geometries are extremely different, making it difficult to construct a meaningful correspondence, so we excluded them as well.

For the nine genus-one models, three models 367, 372, and 378 are like a teapot with a handle and a spout, and 372 is a slightly deformed version of 378, so we chose to pair 367 and 378.

The genus-one model 365 has a very different geometry from any other genus-one models, so we excluded it. For the remaining five genus-one models, their SHA-256 sorted list is:

- `0129` (“374”)
- `3963` (“362”)
- `5f19` (“369”)
- `600b` (“366”)
- `e52d` (“373”)

We created three pairs out of this list (by additionally pairing the first and the last): 374-362, 369-366, and 373-374.

There are eight genus-zero models, but five of them (368, 375, 376, 379, and 380) have extremely different geometries, making it difficult to construct a meaningful correspondence, so we excluded them. For the remaining three models, their SHA-256 sorted list is:

- `9b15` (“371”)
- `a432` (“363”)
- `f160` (“370”)

resulting in a pair 371-363. Fig. 19 and Table 19 show the result of our method applied to these pairs.

Table 19. Statistics of our evaluation with the *Vase* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
367-378	21k	336	18.3h	8.21	4.52
369-366	48k	428	243.8h	5.59	4.37
371-363	11k	264	6.7h	7.12	4.54
373-374	42k	388	118.9h	5.36	4.22
374-362	59k	310	14.3h	4.37	4.10

2.20 *Fourleg* category

In this category, we further classified the models based on whether the tail is separated from the body and whether the mouth is open (i.e. the upper and lower jaws separated). There are four models (381, 382, 387, and 391) whose tail is missing (or merged to the body). Among them, the model 387 is the only one whose mouth is open, so we excluded it. The SHA-256 sorted list for the remaining three models is:

- `392a` (“381”)
- `a934` (“391”)
- `f65c` (“382”)

so we formed a pair: 381-391.

For the remaining 16 models whose tail is separated from the main body, five models have their mouth open, and their SHA-256 sorted list is:

- `04d1` (“394”)
- `188c` (“398”)
- `37b7` (“384”)
- `48b3` (“383”)
- `99a0` (“393”)

resulting in two pairs: 394-398 and 384-383.

For the remaining 11 models, the top four in the SHA-256 sorted list are:

- `0f78` (“399”)
- `131b` (“385”)
- `15a2` (“386”)
- `1d20` (“397”)

resulting in two pairs: 399-385 and 386-397. As noted in the main text, HOT failed for the pair 399-385 while our CIT generation algorithm failed for the pair 386-397. Fig. 20 and Table 20 show the result of our method applied to these pairs.

Table 20. Statistics of our evaluation with the *Fourleg* category in the Princeton Segmentation dataset.

Case name	#F	#N	T	E_{before}	E_{after}
381-391	23k	130	16.3h	40479.50	5.85
384-383	25k	54	8.5h	10.69	9.67
394-398	29k	13	2.4h	244.82	76.93

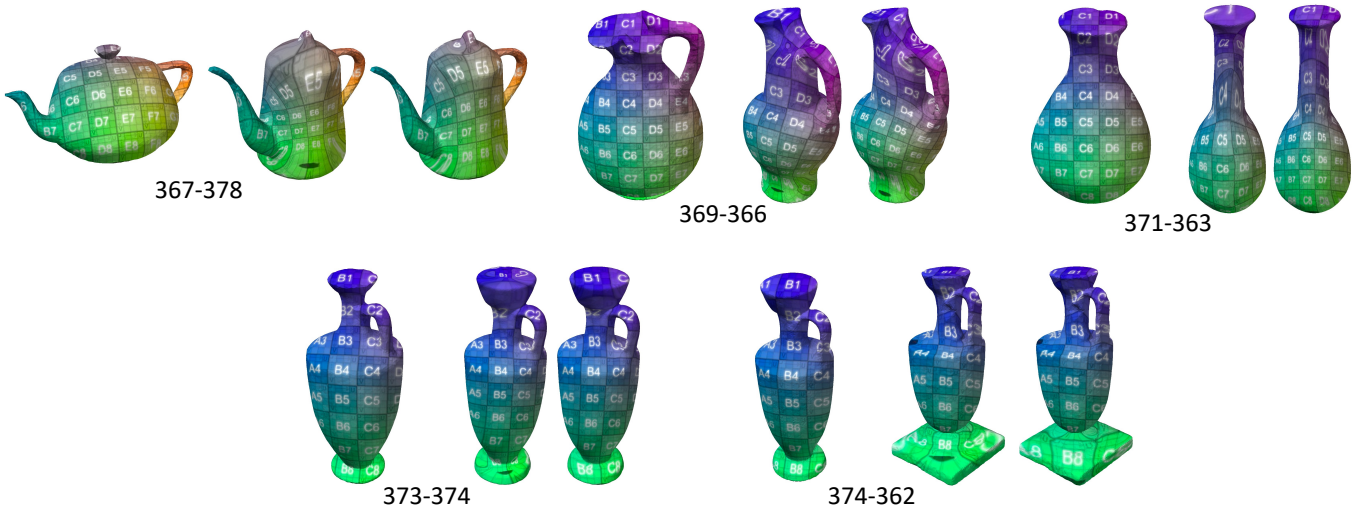

Fig. 19. Result of our method applied to the *Vase* category in the Princeton Segmentation dataset.

Fig. 20. Result of our method applied to the *Fourleg* category in the Princeton Segmentation dataset.