A.5 PER OBJECT ANALYTICS FOR LEARNING-BASED MESH RECONSTRUCTION

In the following, we present the performance metrics across all objects for several modalities. This includes models trained on images (Table 10), images + robot data (Table 11), and point clouds (Table 12). The respective values show the performance on the validation sequence for each object.

Table 10: Prediction metrics for each object for image-based mesh reconstruction. Bold values indicate better performance than the average across all objects.

Input	$\mathcal{L}_{\text{PFD}} \cdot 10^3 \downarrow$	$\mathcal{L}_{\text{ROI}} \cdot 10^3 \downarrow$	**RPFD** $\downarrow$	CD_{UL1}**[mm]** $\downarrow$	$J(M_{\text{P}}, M_{\text{GT}}) \uparrow$
Beanbag	**5.86**	12.78	**0.467**	7.994	**0.833**
Foam cylinder	**5.87**	**7.61**	1.366	9.300	0.767
Foam dice	**5.06**	12.19	0.845	**5.900**	**0.884**
Foam half sphere	**0.81**	**2.24**	**0.229**	**2.640**	**0.927**
Memory foam	9.34	17.21	0.978	**7.432**	0.723
Pillow	**1.35**	**1.88**	0.920	10.70	**0.840**
Plush dice	**4.80**	**5.05**	0.823	9.511	**0.869**
Plush moon	**3.85**	**6.73**	**0.391**	**5.437**	**0.890**
Plush octopus	**2.28**	**2.09**	0.855	**6.851**	0.773
Plush turtle	**2.10**	**0.89**	1.174	9.268	0.732
Plush volleyball	8.96	15.73	**0.290**	9.083	**0.835**
Sponge	8.39	**4.71**	**0.513**	7.661	0.734
Toilet paper roll	24.93	37.33	**0.501**	9.055	0.672
3D printed bunny	10.60	**4.38**	**0.677**	**6.943**	0.714
3D printed cylinder	**5.04**	**6.06**	0.777	**6.005**	**0.820**
3D printed heart	8.17	**4.70**	**0.341**	**6.115**	0.764
3D printed pyramid	**6.53**	**4.09**	0.988	**5.725**	0.695

Table 11: Prediction metrics for each object for using the combination of images and robot data as input. Bold values indicate better performance than the average across all objects.

Input	$\mathcal{L}_{\text{PFD}} \cdot 10^3 \downarrow$	$\mathcal{L}_{\text{ROI}} \cdot 10^3 \downarrow$	**RPFD** $\downarrow$	CD_{UL1}**[mm]** $\downarrow$	$J(M_{\text{P}}, M_{\text{GT}}) \uparrow$
Beanbag	5.70	7.59	0.810	8.114	**0.825**
Foam cylinder	**2.10**	**1.43**	0.623	6.807	**0.844**
Foam dice	**1.66**	5.96	0.667	**4.276**	**0.925**
Foam half sphere	**0.80**	**1.12**	**0.272**	**2.622**	**0.928**
Memory foam	22.27	23.93	1.585	10.007	0.588
Pillow	**0.84**	**0.96**	0.625	9.092	**0.877**
Plush dice	**2.47**	**2.35**	0.629	7.689	**0.902**
Plush moon	**4.32**	**3.43**	**0.518**	**6.304**	**0.869**
Plush octopus	**1.23**	**1.01**	**0.536**	**5.612**	**0.823**
Plush turtle	**1.73**	**0.58**	0.949	8.705	0.760
Plush volleyball	**2.45**	**2.57**	**0.166**	**6.076**	**0.901**
Sponge	**5.29**	**1.43**	**0.340**	**6.439**	0.791
Toilet paper roll	17.94	22.80	**0.385**	7.651	0.726
3D printed bunny	8.79	**3.86**	0.791	**6.284**	0.722
3D printed cylinder	**5.21**	5.61	0.666	**5.943**	**0.822**
3D printed heart	6.79	**4.17**	**0.294**	**5.658**	0.789
3D printed pyramid	5.43	**3.61**	0.878	**5.617**	0.705

Table 12: Prediction metrics for each object for point-cloud-based mesh reconstruction. Bold values indicate better performance than the average across all objects.

Input	$\mathcal{L}_{\mathbf{PFD}} \cdot 10^3 \downarrow$	$\mathcal{L}_{\mathbf{ROI}} \cdot 10^3 \downarrow$	**RPFD** $\downarrow$	$\mathbf{CD_{UL1}}$**[mm]** $\downarrow$	$J(M_{\mathbf{P}}, M_{\mathbf{GT}}) \uparrow$
Beanbag	9.18	8.63	1.402	9.608	0.790
Foam cylinder	**0.73**	**0.67**	**0.337**	**4.701**	**0.909**
Foam dice	**1.98**	**2.6**	**0.414**	**4.415**	**0.924**
Foam half sphere	**0.32**	**1.41**	**0.148**	**2.202**	**0.952**
Memory foam	**4.54**	8.26	**0.578**	**5.008**	0.786
Pillow	**0.85**	**1.23**	0.666	8.835	**0.882**
Plush dice	**2.22**	**2.68**	0.583	7.433	**0.905**
Plush moon	**0.68**	**1.15**	**0.179**	**3.546**	**0.946**
Plush octopus	4.88	**4.68**	1.310	8.937	0.692
Plush turtle	**1.22**	**0.89**	0.98	8.076	0.762
Plush volleyball	**1.67**	**3.36**	**0.106**	**5.307**	**0.921**
Sponge	5.28	**2.55**	**0.354**	7.237	0.760
Toilet paper roll	14.13	17.06	**0.314**	6.901	0.742
3D printed bunny	12.22	7.74	0.883	7.289	0.665
3D printed cylinder	**3.06**	**2.36**	0.573	**4.834**	**0.858**
3D printed heart	9.91	6.73	**0.488**	6.475	0.754
3D printed pyramid	**4.29**	6.97	0.653	**4.681**	0.765