

Supplementary Materials for AssemblyNet: A Point Cloud Dataset and Benchmark for Predicting Part Directions in an Exploded Layout

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A. Supplementary Materials

In these supplementary materials we provide examples of subassemblies from the three different data sources (water pumps, mixed industrial assemblies, and LEGO models), see Fig. 1–3, where the parts which are unblocked are highlighted in red. We also show examples of incorrect predictions made by TP-PointNet++ on the validation set, see Fig. 4–5. The green arrows indicate the correct ground truth direction of the part, whereas the red arrows indicate the incorrectly predicted direction. Furthermore, Tab. 1 presents results for all methods using their original activation functions compared to the main results using the GELU activation function.

Table 1. We show the results of all methods using their original activation functions compared to using the GELU activation function. The original functions are for DGCNN and TP-DGCNN LeakyReLU, while SimpleView, PointNet, PointNet++, and TP-PointNet++ all use ReLU. The results are all for the Original-Dir. setting.

Model	Original Activation		GELU	
	Val.	Test	Val.	Test
PointNet	35.22%	48.49%	35.67%	53.28%
PointNet++	83.82%	84.69%	84.02%	90.20%
DGCNN	71.48%	80.44%	72.36%	87.43%
SimpleView	62.87%	63.66%	67.14%	65.84%
TP-DGCNN	60.90%	83.58%	62.25%	85.61%
TP-PointNet++	78.43%	71.92%	79.19%	78.97%

*Equal contribution.

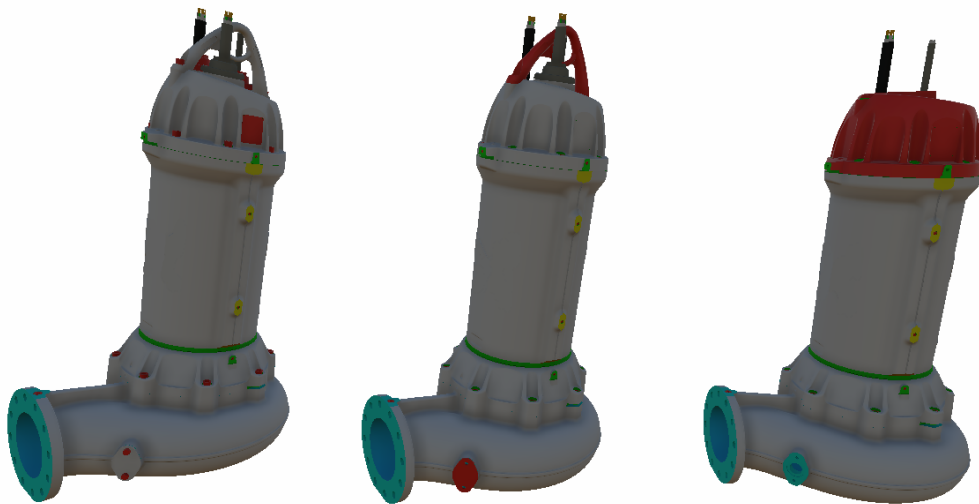
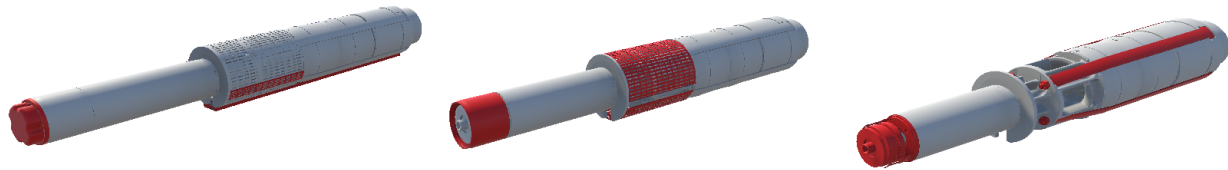


Figure 1. **Water pump examples.** Example of subassemblies constructed from a water pump model. Movable parts in each subassembly are shown in red.

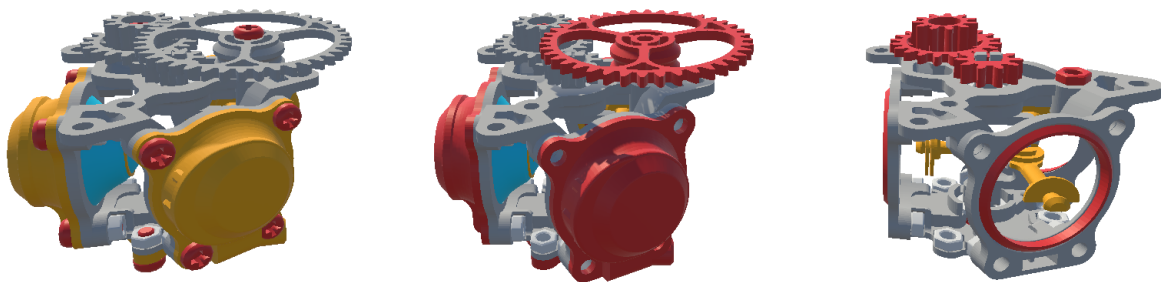
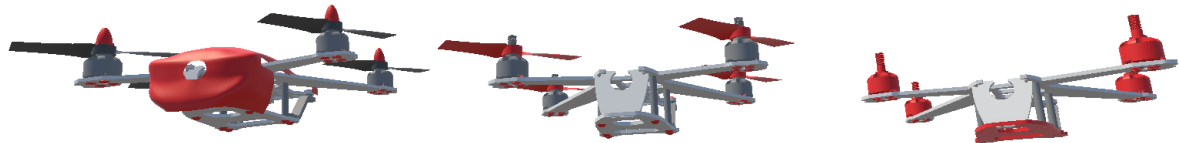


Figure 2. **Industrial assembly examples.** Example of subassemblies constructed from mixed industrial assemblies. Movable parts in each subassembly are shown in red.

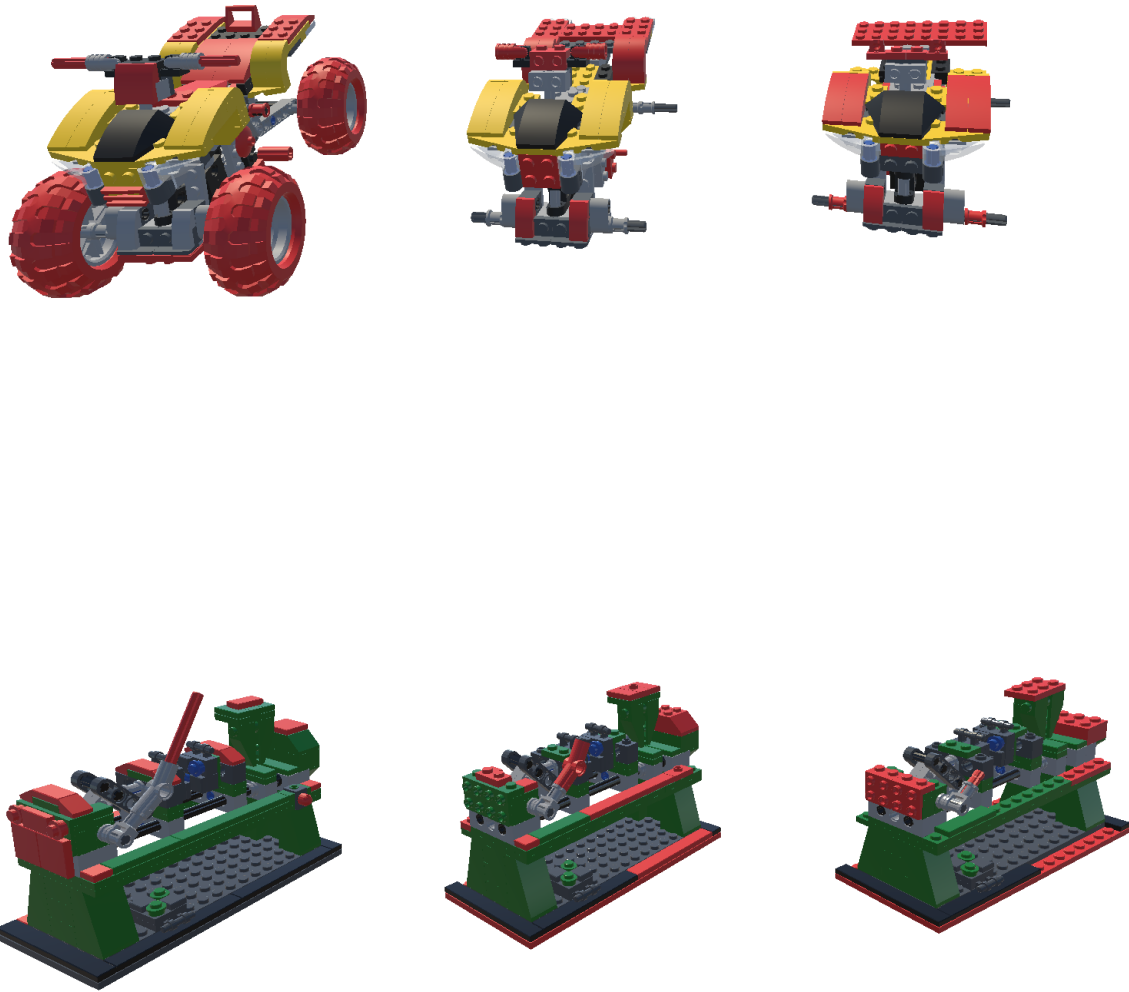


Figure 3. **LEGO examples.** Example of subassemblies constructed from LEGO bricks. Movable parts in each subassembly are shown in red.

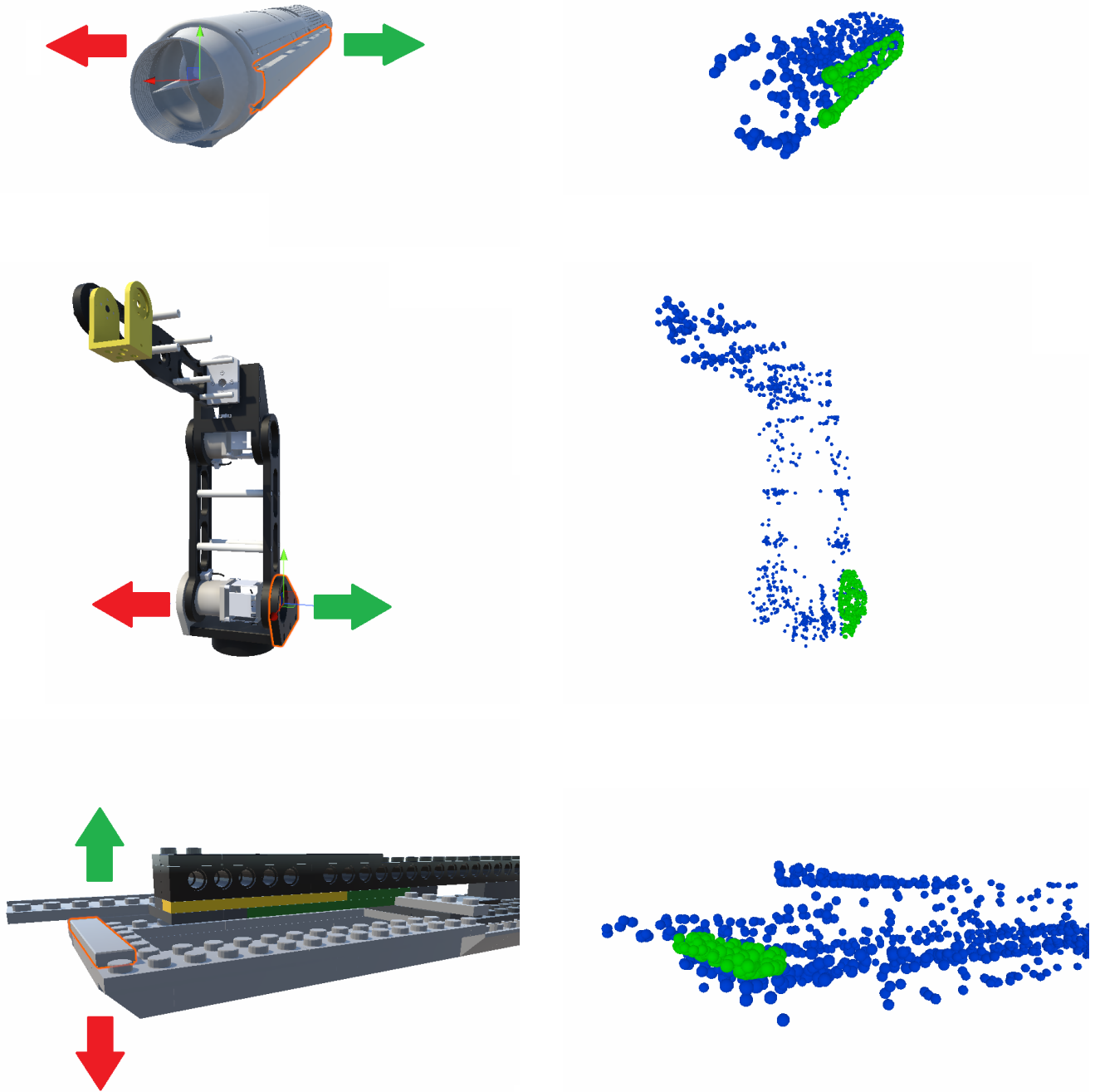


Figure 4. **Incorrect predictions - Opposite direction.** We show examples of subassemblies and parts where the predicted part direction (red arrow) is the direct opposite of the ground truth direction (green arrow). The CAD models are shown in the left column with the part highlighted by a orange border. The right column shows the subassembly and part point clouds with blue and green points, respectively.

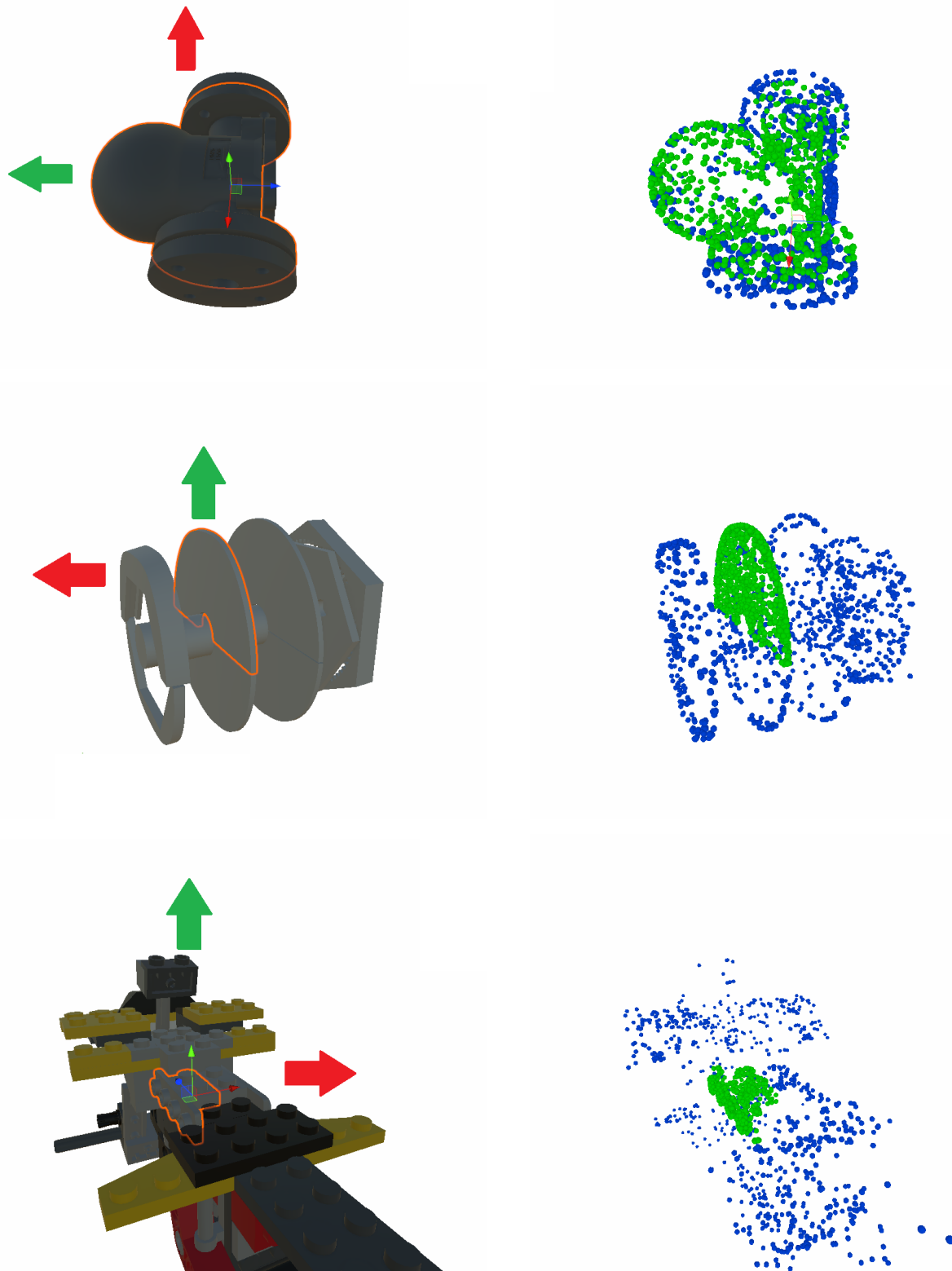


Figure 5. **Incorrect predictions - Orthogonal direction.** We show examples of subassemblies and parts where the predicted part direction (red arrow) is orthogonal to the ground truth direction (green arrow). The CAD models are shown in the left column with the part highlighted by a orange border. The right column shows the subassembly and part point clouds with blue and green points, respectively.