On the Robustness of 3D Object Detectors - Supplementary Material

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1 SUPPLEMENTARY MATERIAL

This supplementary document contains further detailed results of the experiments mentioned in the main paper. Here, we include the tables that show per class AP of the detectors on clean validation-set in Table 1. Tables 2 and 3 show class's AP after adding Local and Background Noise respectively.

Moreover, we include graphs that show the trend by which the four model deteriorate in accuracy with every level of severity. Fig. 1 plots the mAP after the Drop Global and Drop Local corruptions. Fig. 2 shows the mAP after the Drop Object and Drop Background corruptions. Fig. 3 shows the mAP after the Drop Object Parts corruption with and without updating the bounding boxes. Fig. 4 show the mAP after the Add Global, Add Local, and Scene Expansion corruptions. Finally, Fig. 5 shows the mAP after the Jitter corruptions.

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Table 1: Per-category evaluation on clean validation-set of ScanNet evaluated with AP@0.25 IoU.

Method	cab	bed	chair	sofa	tabl	door	windw	bkshf	pic.	contr	desk	curtn	frdge	showr	toilt	sink	bath	ofurn	mAP
VoteNet	35.00	88.60	88.88	88.07	58.53	47.46	36.33	47.65	5.70	59.98	67.18	45.13	45.65	63.28	92.64	53.29	89.21	39.37	58.44
MLCVNet	43.47	90.22	90.65	87.11	67.44	55.11	45.39	60.03	13.34	58.22	75.04	54.29	61.27	72.00	99.26	57.76	91.26	48.38	65.01
Group-Free	53.43	89.35	93.17	86.48	72.73	60.24	52.11	62.43	15.69	69.02	81.93	66.38	46.55	75.47	94.63	74.38	94.87	54.00	69.05
3DETR	48.14	83.43	86.45	82.71	63.41	50.09	41.67	53.12	12.11	51.06	73.01	56.21	54.88	49.25	99.15	67.75	82.17	44.16	61.04

Table 2: Per-category evaluation on ScanNet after adding Local Noise evaluated with AP@0.25 IoU.

Method	cab	bed	chair	sofa	tabl	door	windw	bkshf	pic.	contr	desk	curtn	frdge	showr	toilt	sink	bath	ofurn	mAP
VoteNet	34.97	88.38	58.29	90.06	53.10	48.29	35.74	45.05	7.12	50.85	65.33	47.23	47.01	59.66	94.77	51.14	90.75	34.34	55.67
MLCVNet	44.18	89.52	64.15	88.36	62.20	56.68	43.53	57.63	13.69	56.86	72.21	55.00	61.84	74.56	96.17	59.18	94.34	45.62	63.10
Group-Free	54.47	89.58	53.04	86.39	63.84	60.05	51.35	61.17	14.50	69.92	71.83	64.48	49.63	75.53	95.83	73.62	94.19	54.05	65.75
3DETR	40.98	84.11	48.29	84.52	50.02	47.66	36.71	48.63	12.54	57.04	57.03	49.24	55.84	54.98	99.71	63.28	85.28	38.73	56.37

Table 3: Per-category evaluation on ScanNet after adding Background Noise evaluated with AP@0.25 IoU.

Method	cab	bed	chair	sofa	tabl	door	windw	bkshf	pic.	contr	desk	curtn	frdge	showr	toilt	sink	bath	ofurn	mAP
VoteNet	1.35	21.27	16.00	1.42	10.59	1.02	3.96	2.12	0.00	3.77	9.51	1.84	1.58	0.05	1.26	1.08	4.15	0.33	4.52
MLCVNet	0.49	20.68	10.42	1.68	4.01	0.27	1.58	1.14	0.00	1.72	7.31	0.70	2.81	0.29	8.20	1.05	8.06	0.54	3.94
Group-Free	0.35	6.22	3.06	2.28	3.91	0.44	1.05	0.93	0.00	1.52	1.92	1.15	0.10	0.00	0.21	0.34	0.00	0.06	1.31
3DETR	0.17	2.01	0.68	0.31	0.35	2.21	0.23	0.72	0.00	0.00	0.57	0.07	0.11	0.01	0.05	0.00	0.34	0.04	0.44

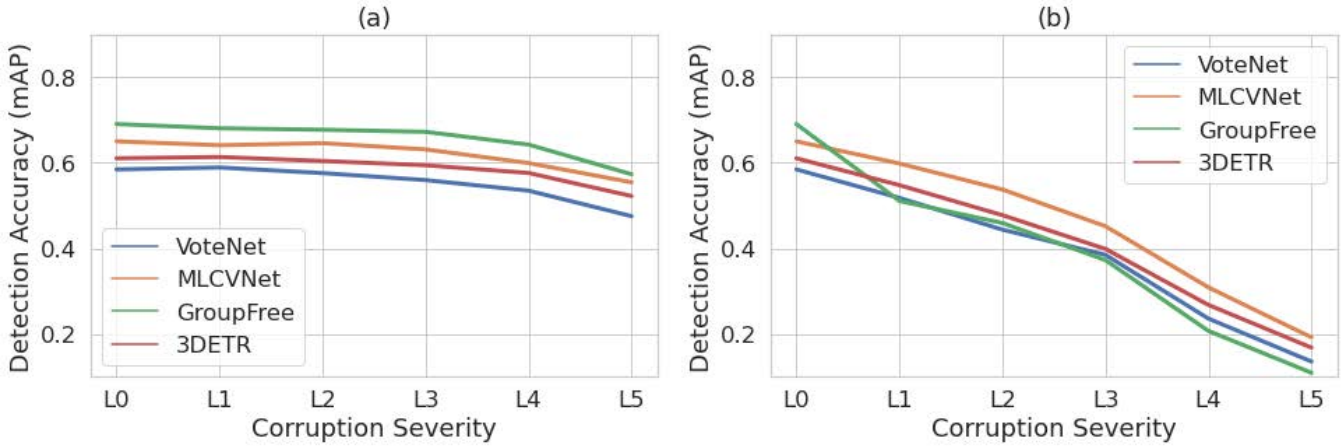

Figure 1: Detection Accuracy (mAP@0.25 IoU) for (a) Drop Global and (b) Drop Local corruptions over different architectures. The corrupted point clouds are evaluated on VoteNet, MLCVNet, 3DETR, and Group-Free.

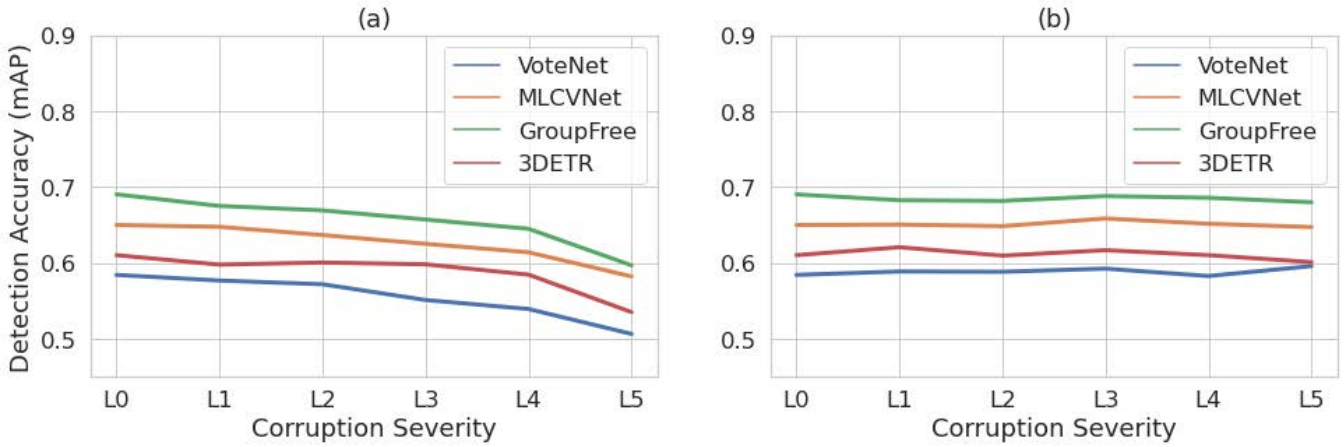

Figure 2: Detection Accuracy (mAP@0.25 IoU) for (a) Drop Object and (b) Drop Background corruptions over different architectures.

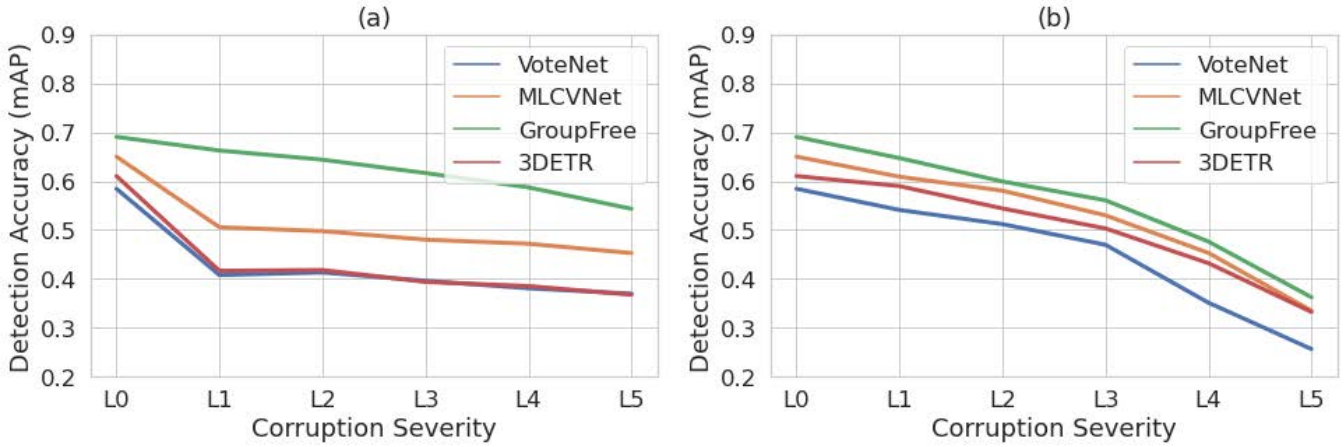

Figure 3: Detection Accuracy (mAP@0.25 IoU) for (a) Drop Object Parts and (b) Drop Object Parts with updated bboxes over different architectures.

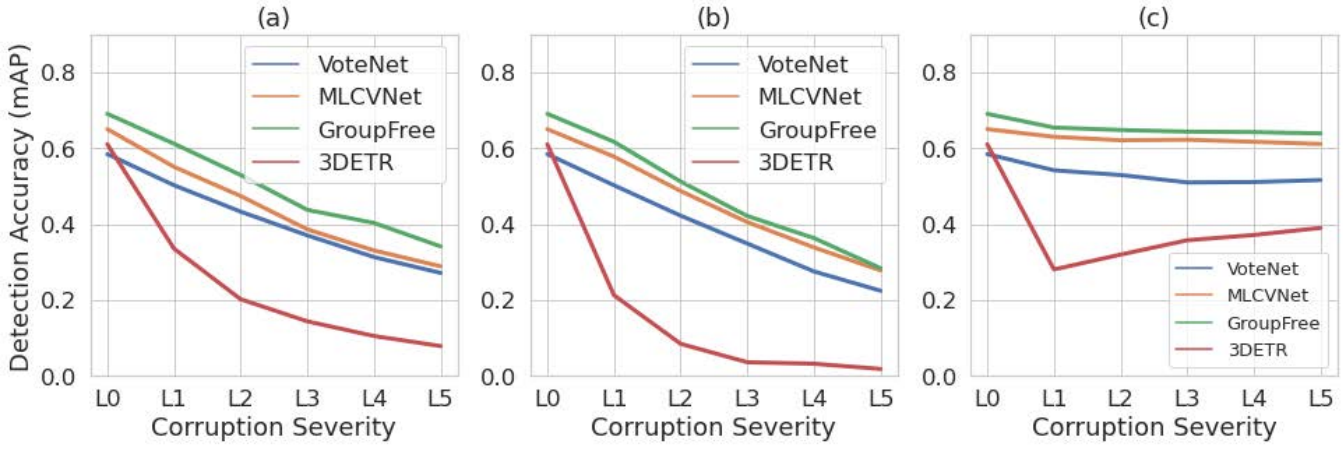

Figure 4: Detection Accuracy (mAP@0.25 IoU) for (a) Add Global, (b) Add Local, and (c) Scene Expansion corruptions over different architectures.

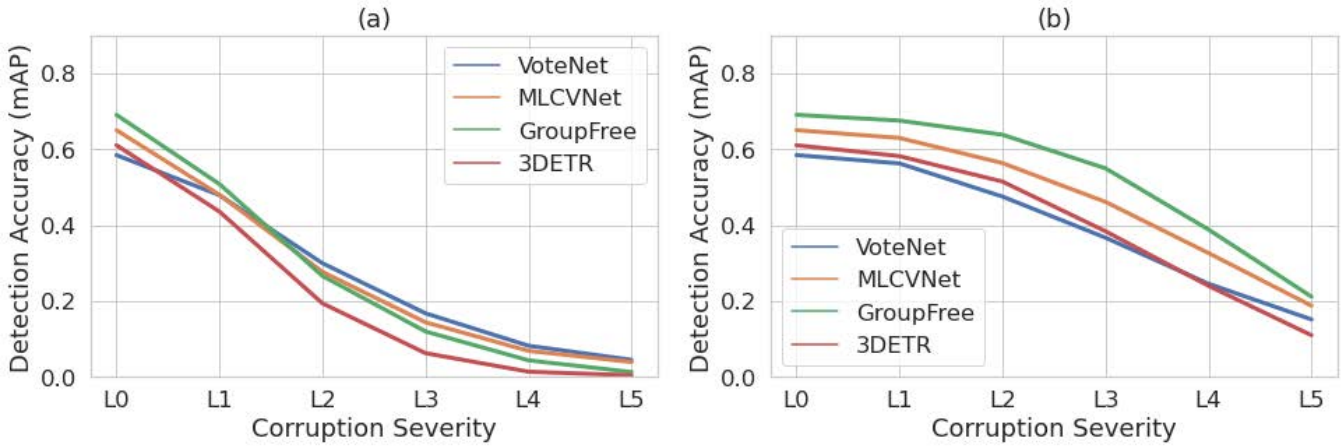

Figure 5: Detection Accuracy (mAP@0.25 IoU) for (a) Jitter and (b) Floor Plane Inclination corruptions over different architectures.