HGNet: Learning Hierarchical Geometry from Points, Edges, and Surfaces ——CVPR 2023 Supplementary Material

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The supplementary material contains the standard 6-fold cross-validation results of our HGNet [14] on S3DIS benchmark for semantic segmentation task.

1. Semantic Segmentation on S3DIS

Recall that in the main paper, we evaluate our HGNet on S3DIS benchmark by taking Area-5 as the testing scene and the remaining scenes as training set. Here we conduct additional experiments to evaluate our HGNet on S3DIS under the standard 6-fold cross-validation protocol. Table 1 lists the performance comparisons by using 6-fold cross-validation on S3DIS. Similarly, our HGNet clearly surpasses the point-based, edge/relation-based, and surface-based approaches, leading to the best performances across all the three metrics. Specifically, in comparison to PointNeXt-l, HGNet boosts up the performances by 1.2%, 2.0%, and 1.9% in OA, mAcc, and mIoU, respectively. The results again show the effectiveness of our HGNet on semantic segmentation task, even under the 6-fold cross-validation protocol.

Table 1. Comparison results of HGNet with other state-of-the-art methods on S3DIS for semantic segmentation under the 6-fold cross-validation protocol.

Method	OA	mAcc	mIoU	Params.	Throughput
PointNet [4]	78.5	66.2	47.6	3.6M	162
PointNet++ [5]	81.0	67.1	54.5	1.0M	186
DGCNN [11]	84.1	-	56.1	1.3M	8
DeepGCN [2]	85.9	-	60.0	3.6M	3
PointCNN [3]	88.1	75.6	65.4	0.6M	-
PointWeb [16]	87.3	76.2	66.7	-	-
ShellNet [15]	87.1	-	66.8	-	-
PointASNL [13]	88.8	79.0	68.7	22.4M	-
PAConv [12]	-	78.6	69.3	-	-
RandLA-Net [1]	88.0	82.0	70.0	1.3M	159
KPConv [10]	-	79.1	70.6	15.0M	30
RPNet [9]	-	-	70.8	2.4M	-
BAAF-Net [7]	88.9	83.1	72.2	5.0M	10
Point Transformer [17]	90.2	81.9	73.5	7.8M	34
PointNeXt-l [6]	89.8	82.2	73.9	7.1M	115
RepSurf-U [8]	90.8	82.6	74.3	0.99M	69
HGNet	**91.0**	**84.2**	**75.8**	7.8M	92

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