

# FATNET: A FEATURE-ATTENTIVE NETWORK FOR 3D POINT CLOUD PROCESSING

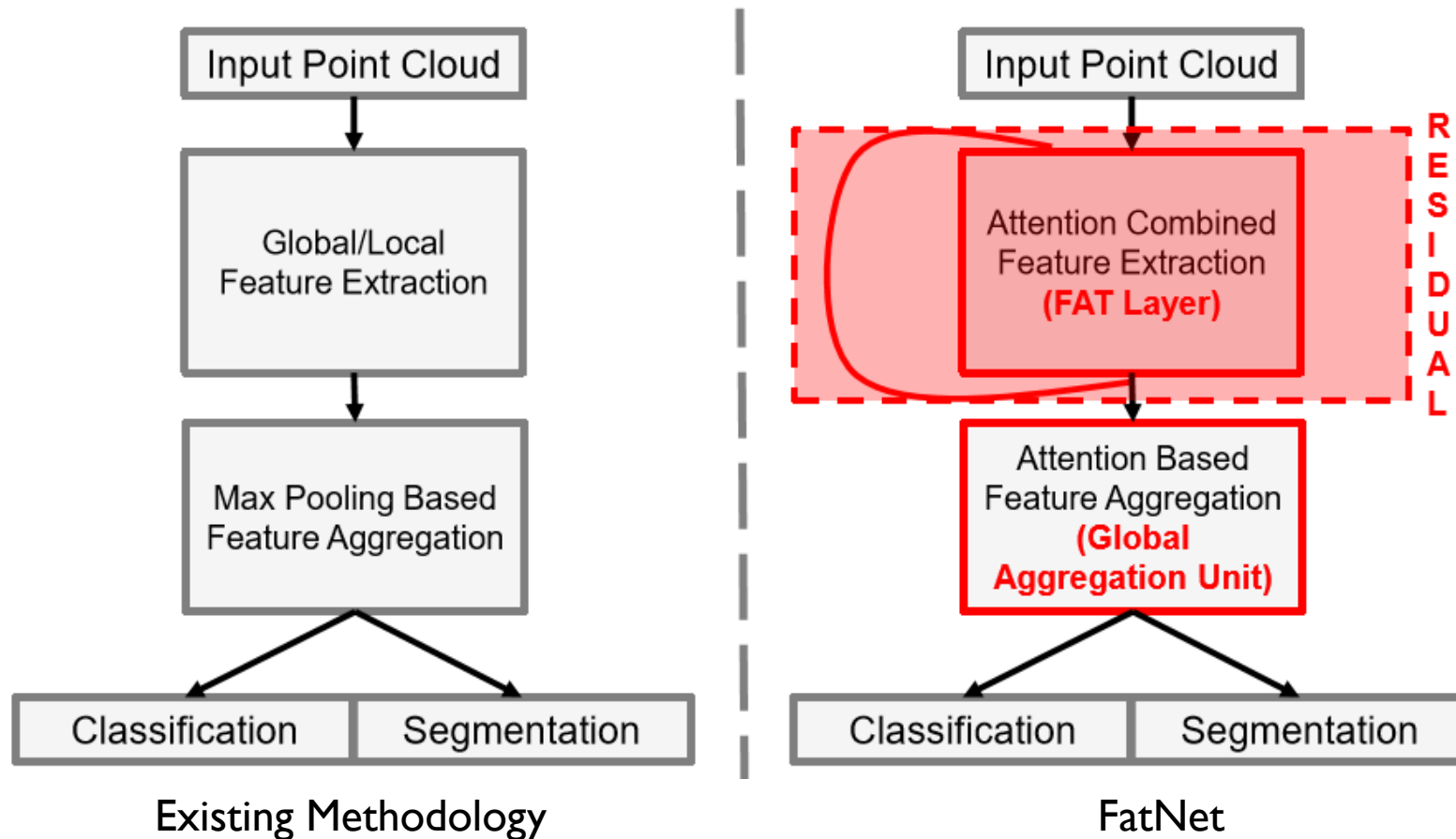
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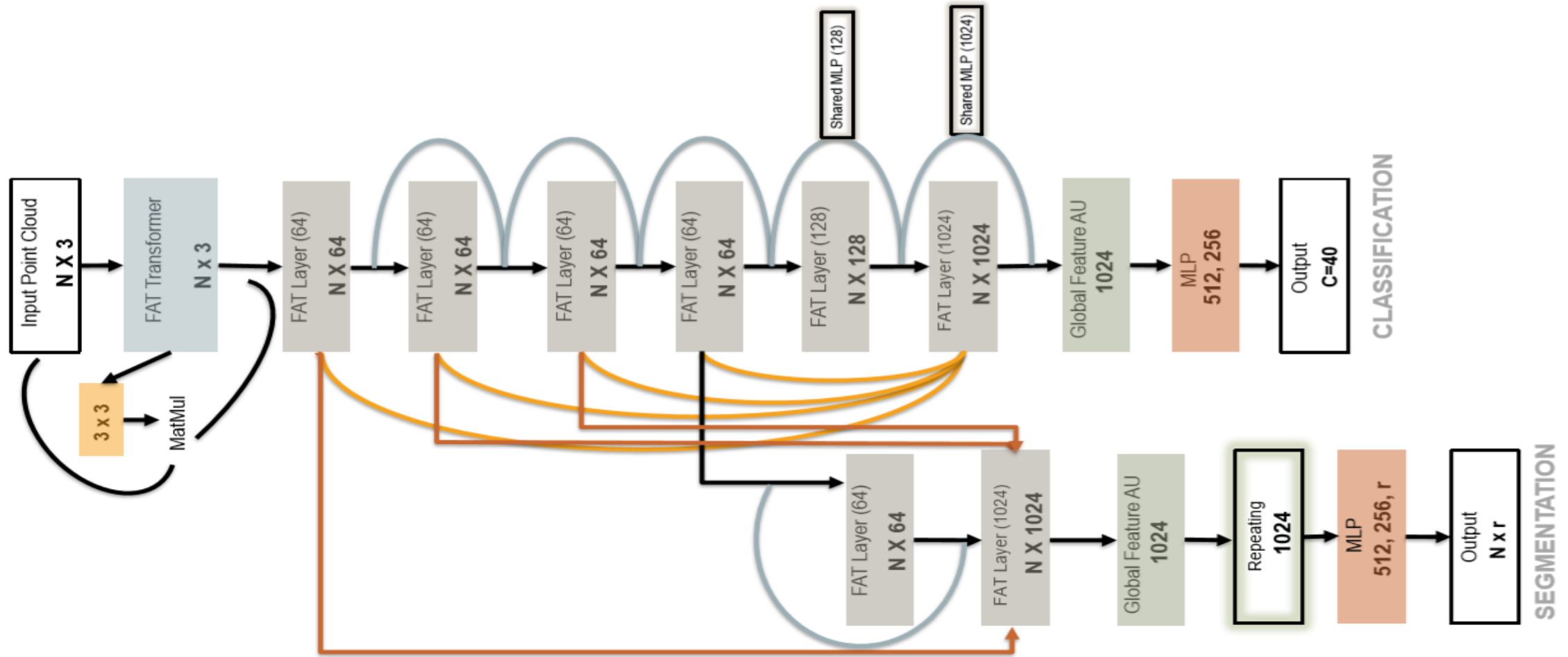
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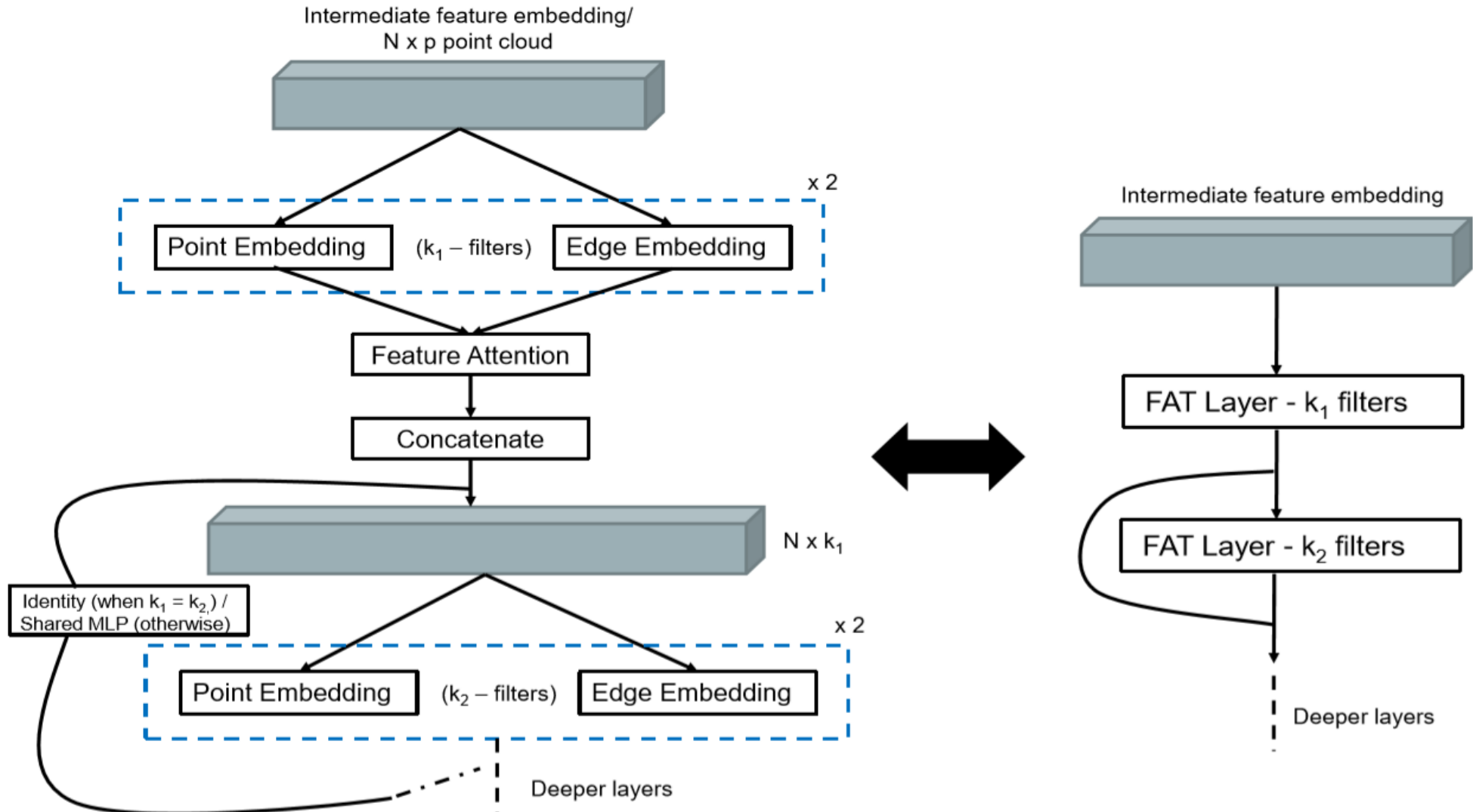
# FATNET VS OTHER METHODS



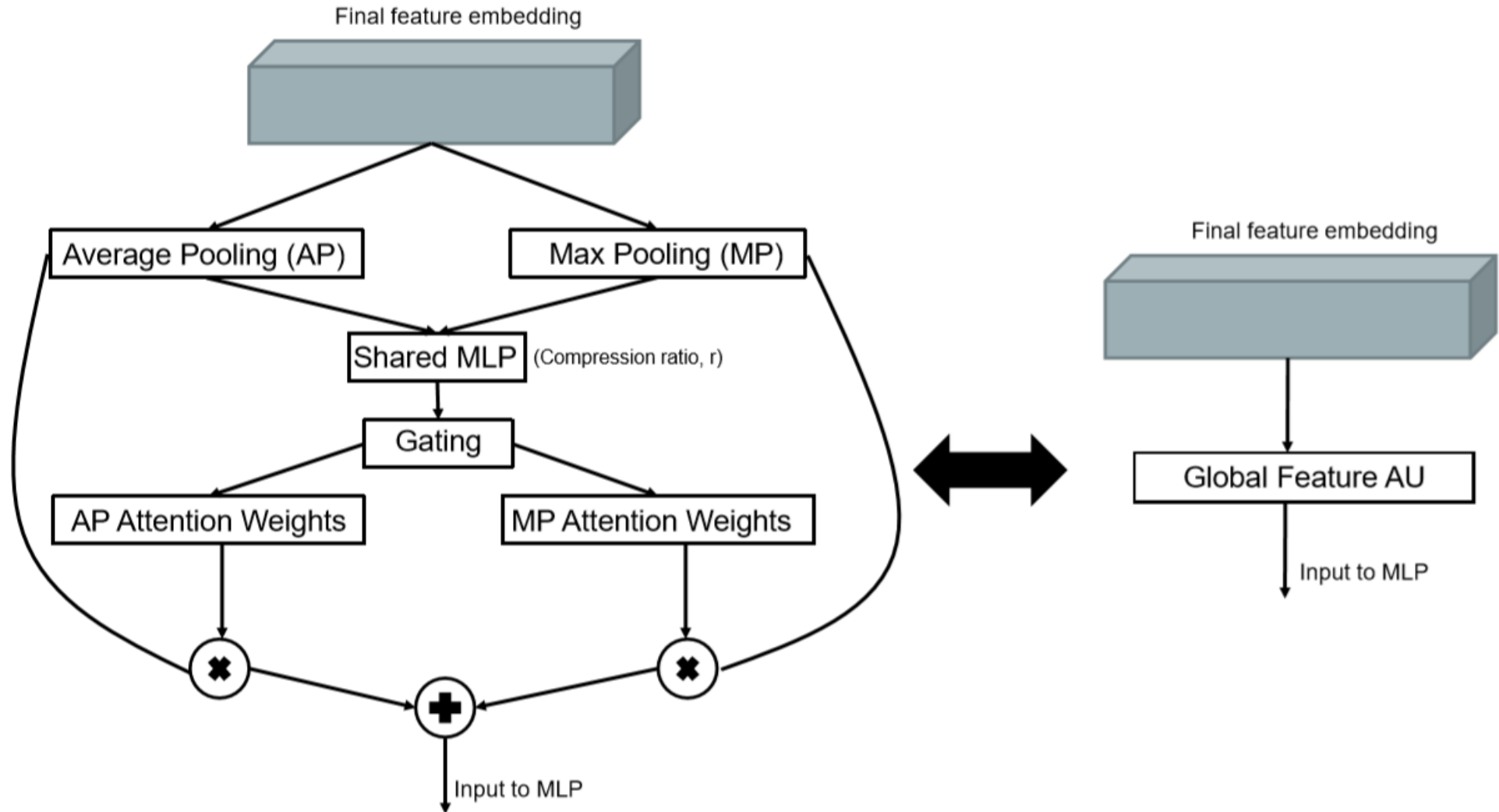
# THE FATNET ARCHITECTURE



# FATNET BLOCKS – FAT LAYER



# FATNET BLOCKS – GLOBAL FEATURE AGGREGATION LAYER



## FATNET CLASSIFICATION RESULTS

Method	Class Accuracy (%)	Instance Accuracy (%)
3D ShapeNets [18]	77.3	84.7
VoxNet [8]	83.0	85.9
Subvolume [21]	86.0	89.2
ECC [22]	83.2	87.4
PointNet [1]	86.0	89.2
PointNet++ [3]	-	90.7
KD-Net (Depth 10) [23]	86.3	90.6
KD-Net (Depth 15) [23]	88.5	91.8
DGCNN [4]	90.2	92.2
SO-Net [12] ( $2048 \times 3$ )	87.3	90.9
SpiderCNN [13]	-	90.5
PCNN [24]	-	92.3
PointCNN [14]	88.1	92.2
FatNet Vanilla (Ours)	90.0	91.8
FatNet (Ours)	<b>90.6</b>	<b>93.2</b>

## FATNET SEGMENTATION RESULTS

Method	IoU
Kd-Net [23]	82.3
SO-Net [12]	84.6
RSNet [26]	84.9
3DmFVNet [27]	84.3
SyncSpecCNN [28]	84.7
PointNet++ [3]	85.1
SpiderCNN [13]	85.3
SPLATNet [29]	85.4
PointCNN [14]	<b>86.1</b>
PCNN [24]	85.1
PointNet [1]	83.7
DGCNN [4]	85.1
FatNet (MP)	85.3
FatNet	<b>85.5</b>

# FATNET ROBUSTNESS

Method	Parameters ( $\times 10^8$ )	Model Size (MB)	Inference time (ms)	Accuracy (%)
PointNet [1]	3.5	40	16.6	89.2
PointNet++ [3]	1.5	12	163.2	90.7
DGCNN [4]	1.9	21	27.2	92.2
PCNN [24]	8.2	94	117.0	92.3
FatNet	2.7	41	52.3	93.2

