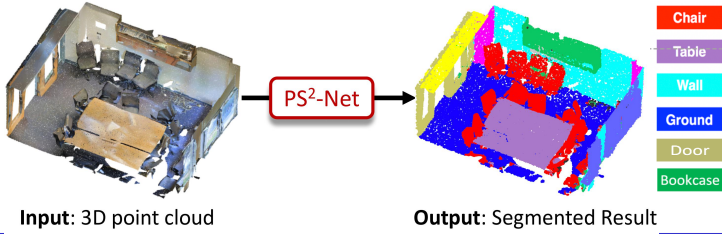
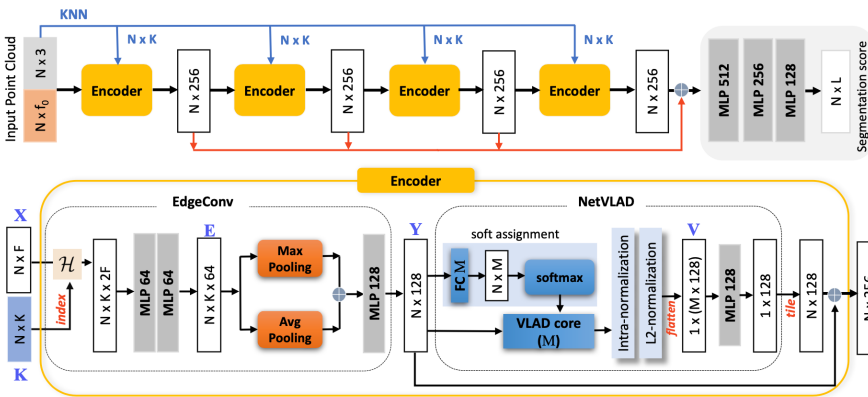


Introduction



- Given the 3D point cloud of a scene, the objective of 3D semantic segmentation is to assign a class label to each point in the point cloud.
- Due to the irregular and unordered characteristics of point clouds, it is difficult to directly implement classic deep neural networks that are not permutation invariant on 3D point clouds. Thus, how to design a permutation-invariant model for point cloud based 3D semantic segmentation is a challenging problem.

Approach



Contributions:

- We design PS²-net - an end-to-end network for semantic scene segmentation on 3D point clouds. Our network is permutation-invariant, and is able to integrate both local structures and global context.
- Our encoder is flexible and can be stacked or recurrently plugged into existing deep learning architectures to exploit the fine-grained local and global properties from point clouds.
- Extensive experimental results on two large-scale 3D indoor datasets show that our PS²-net outperforms existing state-of-the-art approaches on the task of semantic scene segmentation on 3D point clouds.

Results

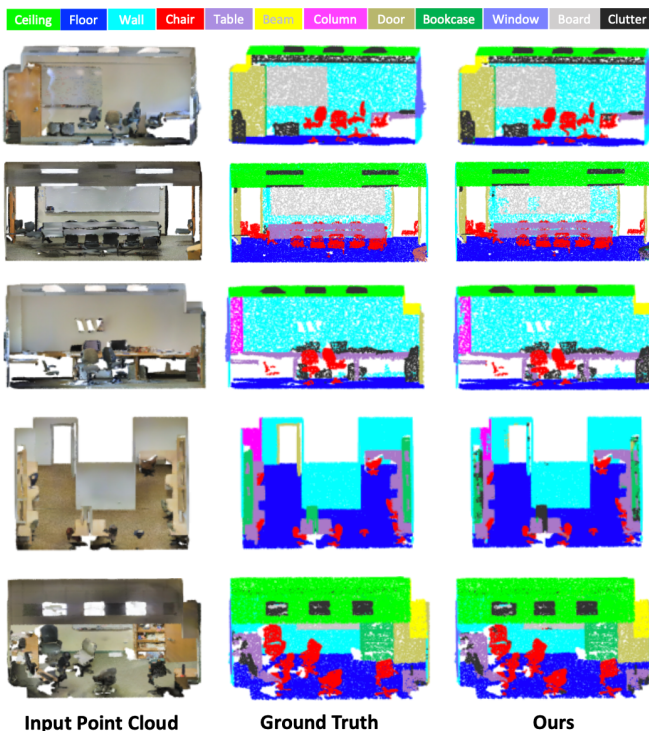


Figure 3. PS²-Net semantic segmentation results on S3DIS.

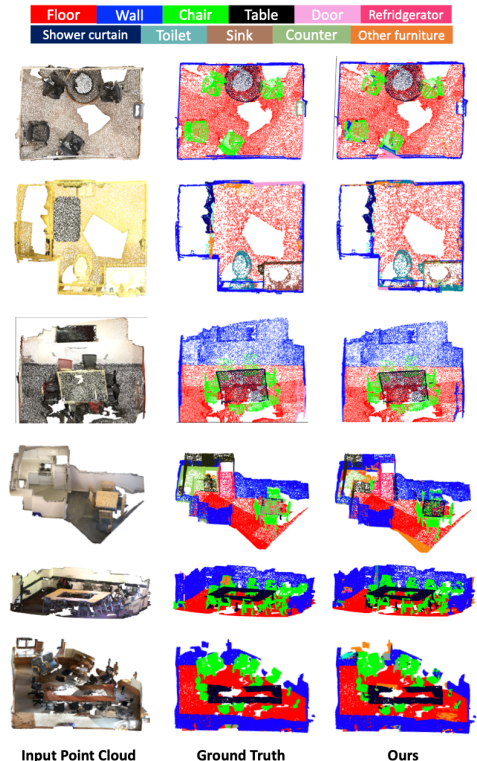


Figure 4. PS²-Net semantic segmentation results on ScanNet.