

Master's Thesis

# 3D Semantic Panoptic Completion and Object Detection for RGB-D Scans

3D scans work as the important data modality in perception system of AR/VR and robotics. With the development of commodity RGB-D sensors, the 3D scans from real-world is much easier to obtain. However, the incomplete nature of 3D scans caused by inherent occlusions due to physical limitation still impact the performance of perception system. So several research communities focus on several tasks to expand the incomplete partial scan including completion, semantic segmentation, object detection. To predict missing information or extract high-level semantic feature, the deep neural network should be designed.

In summary, the master thesis aims to take incomplete partial scan, predict the unseen and missing geometry to obtain complete high-resolution 3D reconstruction and assign semantic information to each voxel, then detect the object conditioned on the complete semantic scene. To get the better performance in real-world task, the model will be trained using the ScanNet since it comes from real-world scan.

## Advisors

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