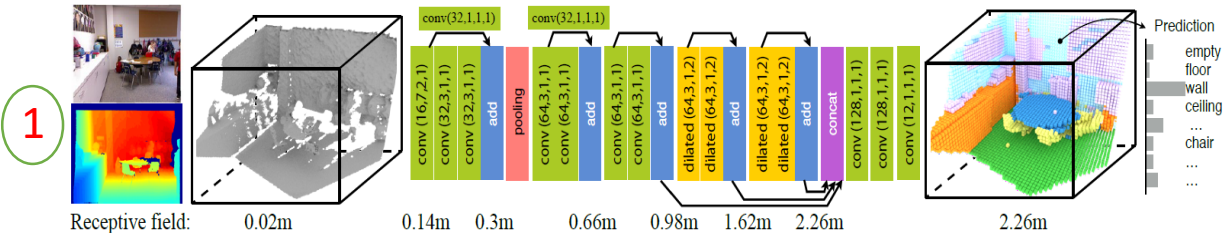2016

1. **SSCNet from Single Depth Map:** dilation-based 3D voxel context learning
   Dataset: **SUNCG** - synthetic 3D scenes with dense volumetric annotations IoU, Precision, Recall
   Methods: RGB-D SS, Shape completion, 3D Model Fitting, Voxel space reasoning
   3 Encodings - **Truncated Signed Distance Function with SS VSDM** (NYU-Depth v2 dataset → SUNCG)
   Better than: Object centric networks, Deep Sliding Shape, 3D Match Net (voxel)

2017

2. **OctNetFusion:** Learning based approach for Dense Depth Fusion from Data (TSDF)
   3D CNN architecture - learns to predict an implicit surface representation from the input depth maps.
   Reconstructs occluded regions, achieves noise reduction and outlier suppression
   structure* doubles the spatial resolution of the feature maps. Triangle loss Q.
   ModelNet40 dataset → Kinect Object Scans → volumetric fusion from 80 views

2017

3. **Learning Eff. Point Cloud Gen.** for Dense 3D Obj.Reconstr.
   2D conv. operations to predict the **3D struc. from multiple viewpoints & then 2D projection optimize**
   Renderering: differentiable module (opt. err/distance - the point cloud & the ground-truth CAD model)
   computational efficiency (outperforms shape-similarity & prediction density) –MSE metrics

2018

4. **3DMV:** Joint 3D-Multi-View Prediction for 3D SS Segmentation
   i/p: RGB-D scan and o/p: predicts a 3D semantic segmentation {per-voxel labels mapped to the mesh)
   extract RGB Image's feature maps → volumetric feature grid of a 3D net (**DBPL**), multi-view pooling
   ScanNet 3D segmentation benchmark : attains 75% accuracy - spatially coherent, High Resol. X
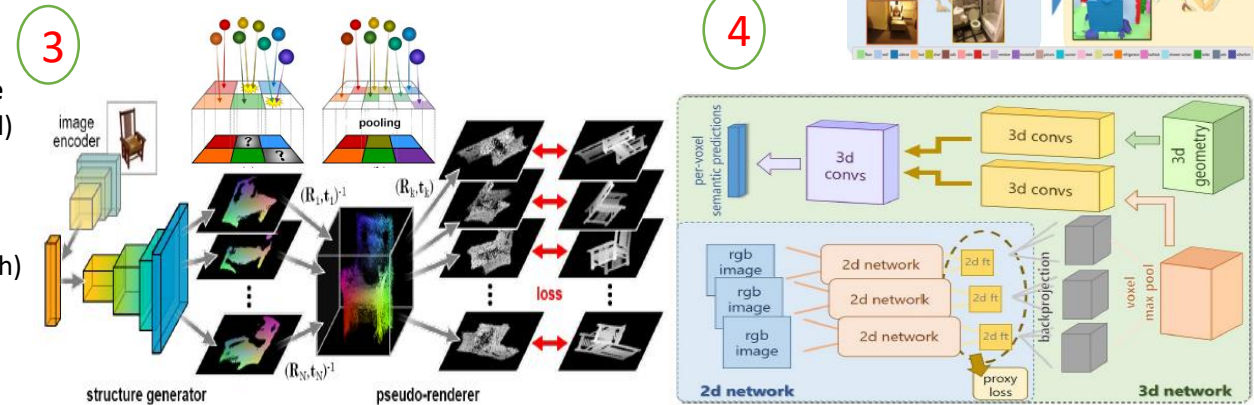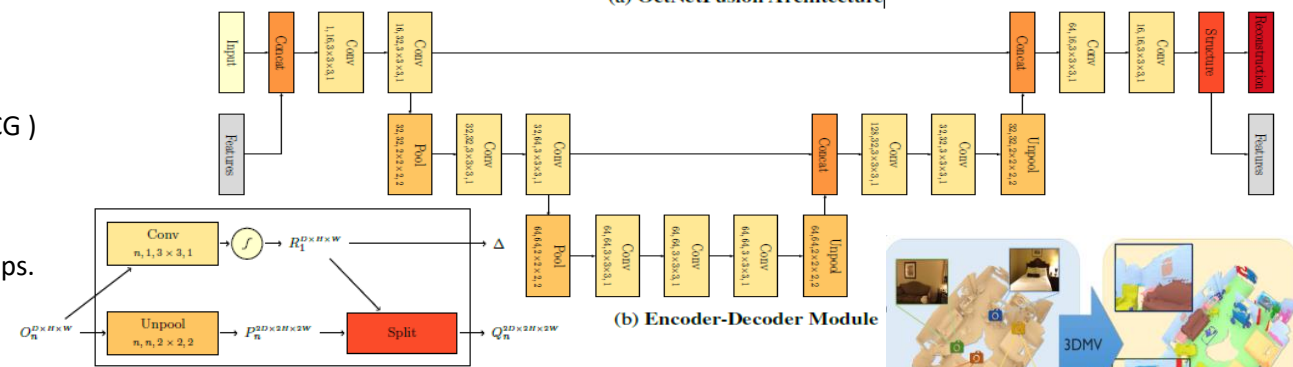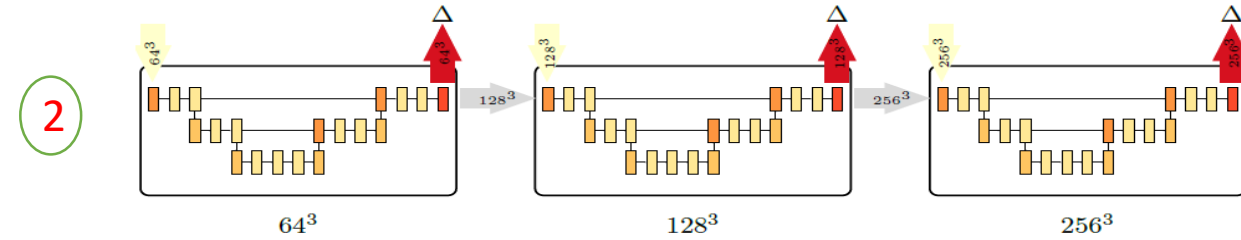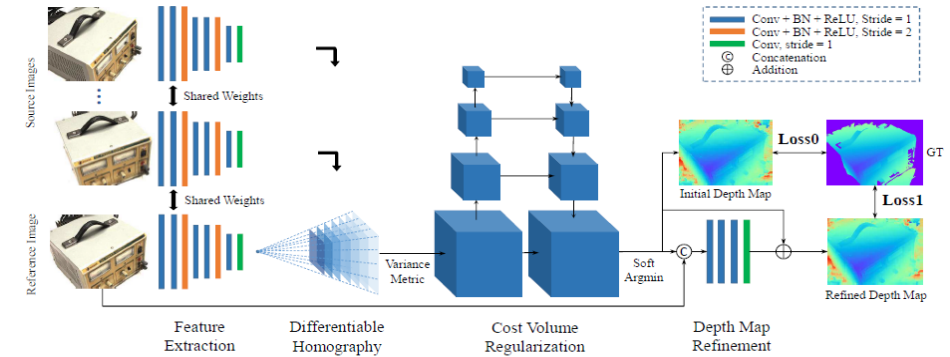
2018

5. MVSNet: Depth Inference for Unstructured Multi-view Stereo (Google and TUM Support)
Ext deep visual img. feat>>build 3D vol. cost by diff. homog warping >>3D conv. to regress initial depth map
Variance-based feature cost metric, DTU Dataset, Post-processing Depth Map Filter – Fast Run Time

⑤

2018

6. DeepTAM: Deep Tracking and Mapping (EU Horizon Project - Trimbot2020)
learning tech: keyframes-based dense camera tracking (small increm. poses) & depth map estimation
Ntk combines cost volume & the keyframe image to update the depth prediction
SUN3D dataset, **Predict → Update Principle,** o/p: Tracking Opt err with Mapping net

⑥

2019

7. R-MVSNet: regularizes the 2D cost maps along the depth direction via GRU.
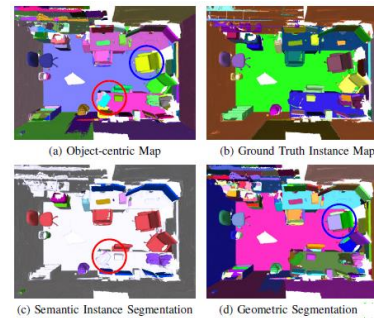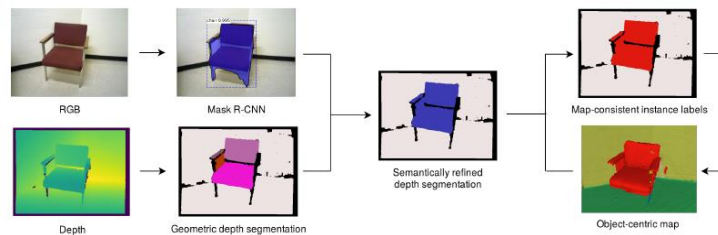Reduces memory consumption & high-resolution reconstruct feasible.
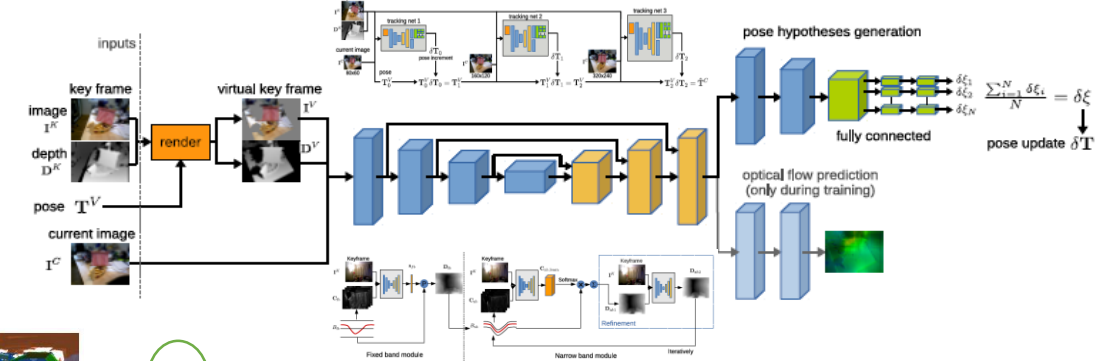
2019

8. **VIASM:** Vol. Instance-Aware Sem. Mapping & 3D Object Discovery (ABB, Amazon, ETH)
approach: **incre.build vol.obj.centric maps during online scanning with a localized RGB-D camera**
<1>to detect: a per-frame seg+unsup geom with instance-aware semantic predictions
<2> tracks predicted across diff. frames and data assoc.
<3> a map integ. semantic class into a global volume
Dataset: SceneNN

⑧

⑦