Volumetric Representations
&
Deep Implicit Models

Summary

Volumetric CNNs

Main Topics

- Overview

  - Images (2D) / Depth (2.5D) / Volumes (3D)

- Depth Maps

  - RGB-D Image / Depth Prediction (scale ambiguity) / Normals

- 3D Grids (voxel)

  - Pros&Cons / Voxelization / 3D Convolution / Memory Complexity / Approximation Issue

- Octree-Based

  - Sparse Structures / Trees / Hash Tables / Progressive Refinement

- Applications of Voxel CNNs

  - Classification / Reconstruction / Volumetric GANs / Recurrent 3D CNN

Deep Implicit Models

Main Topics

- ## Basic Concepts

  - Implicit Function & Level Sets / Polygonization / Ray Tracing

- ## Deep Implicits

  - Occupancy Networks / Deep SDF (Auto Decoder) / Deep Level Sets (Image Inference)

- ## Deep Marching Cubes

  - Surface Prediction / Differentiable Marching Cubes

- ## 3D Shape Completion

  - Tridimensional Encoder - Decoder

- ## State of the Art

  - Deep Implicit Revolution