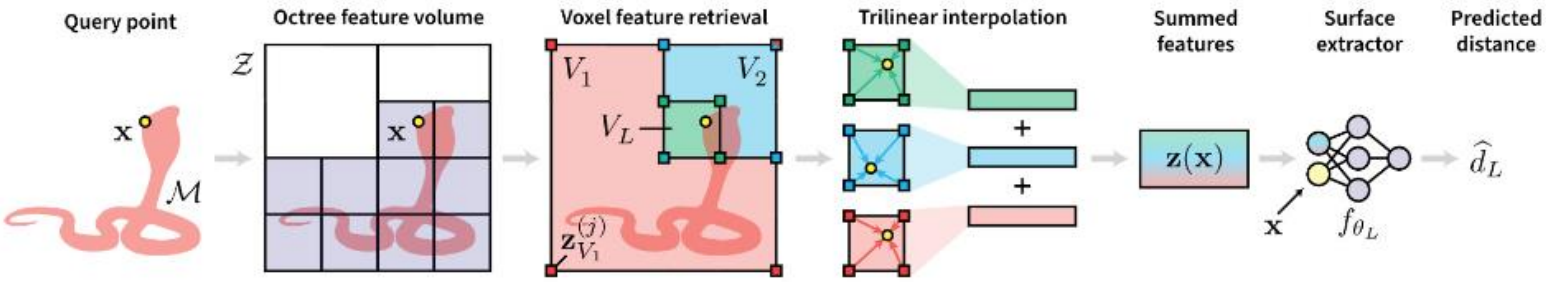
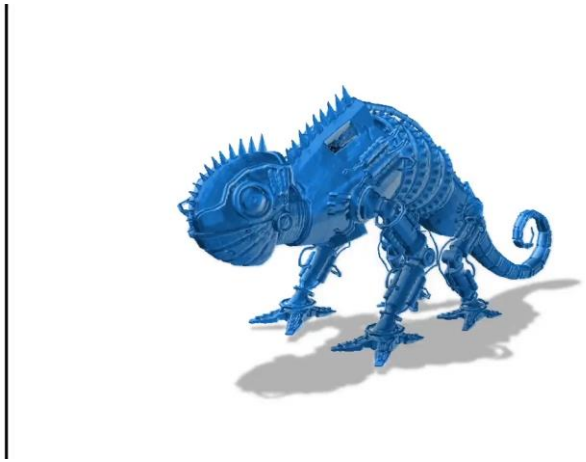
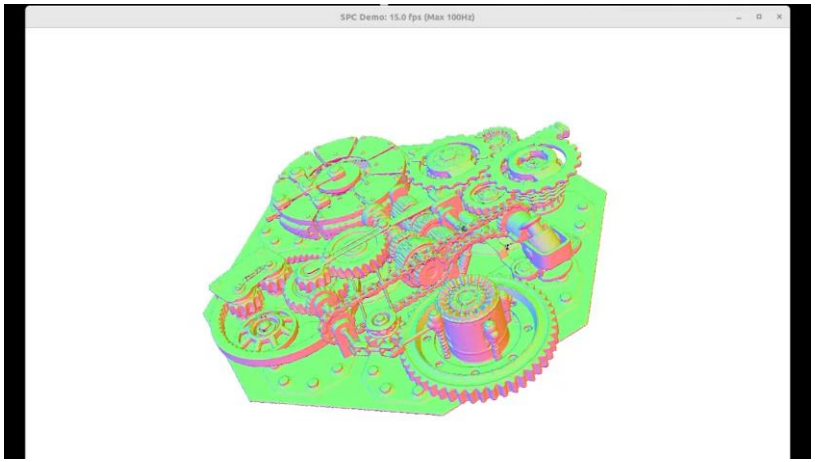
八叉树 vs. 3D CV

Neural Geometric Level of Detail: Real-time Rendering with Implicit 3D Shapes
CVPR 2021 (Oral)







https://research.nvidia.com/labs/toronto-ai/nglod/

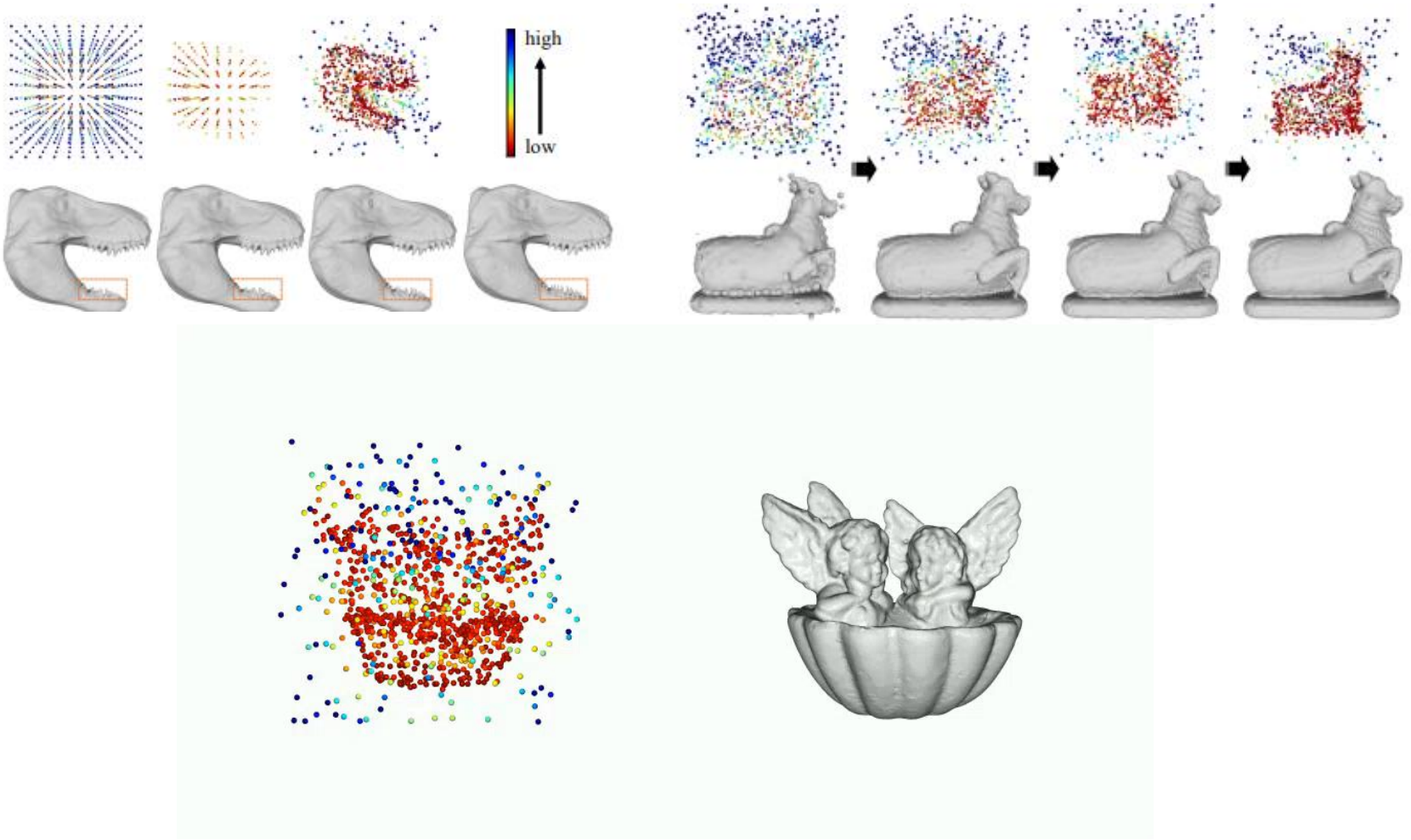
八叉树 vs. 3D CV

ACORN: Adaptive Coordinate Networks for Neural Scene Representation
SIGGRAPH 2021

https://www.computationalimaging.org/publications/acorn/

八叉树 vs. 3D CV

DCC-DIF: Learning Deep Implicit Functions for 3D Shapes with Dynamic Code Clouds
CVPR 2022

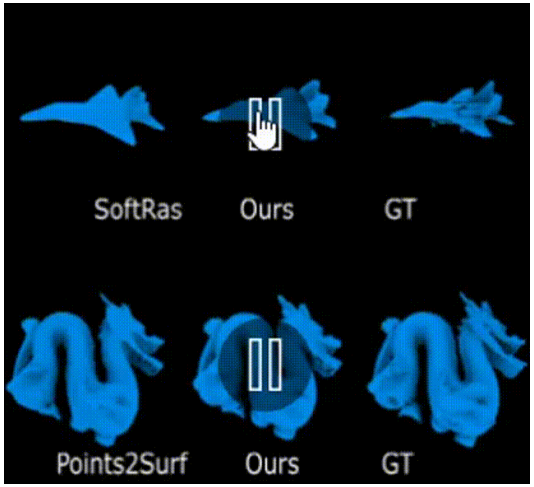


https://lity20.github.io/DCCDIF_project_page/

三维重建— 基于点云的三维重建

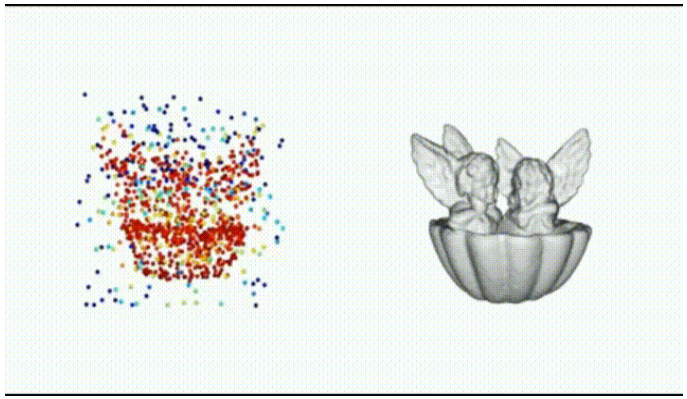
问题与挑战：传统算法对噪声、稀疏等问题不够鲁棒。数据驱动算法需要预定义拓扑结构，使网络表达能力受限。

基于点云的三维隐式表达重建算法:



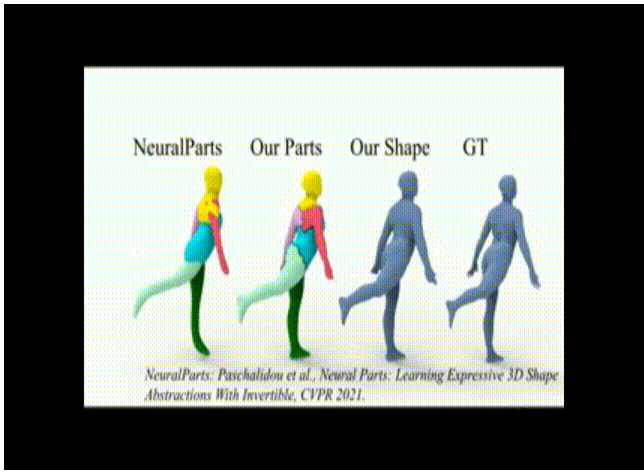
隐式场梯度优化Neural-Pull

(ICML 2021)



动态特征点学习DCC-DIF

(CVPR 2022)



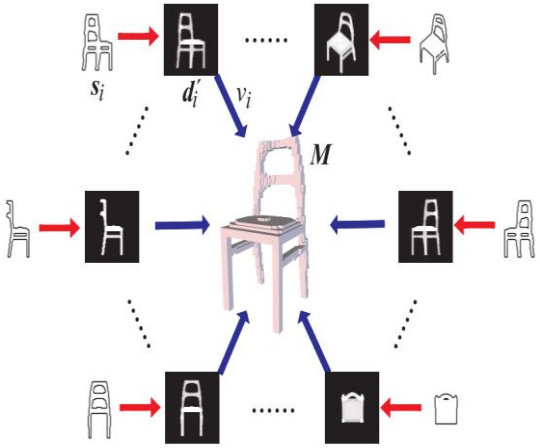
隐式划分学习

(ECCV 2022)

- **4篇**论文发表在CVPR/ICML；
- 相关点云重建算法被应用于**快手三维场景重建项目**；
- 应用于**珠宝三维重建工程项目**；普通光源下金属、晶体等镜面物体的三维重建，可在5分钟内重建戒指、吊坠、手镯等；

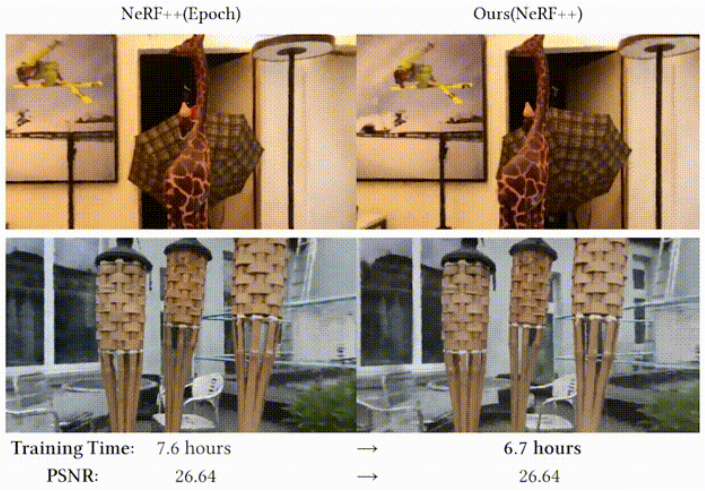
三维重建—多视图的三维重建

问题与挑战：针对少量图片输入，现有多数深度学习算法的三维重建质量低，优化时间长；传统方法对镜面物体存在高光反射问题（有相机参数）

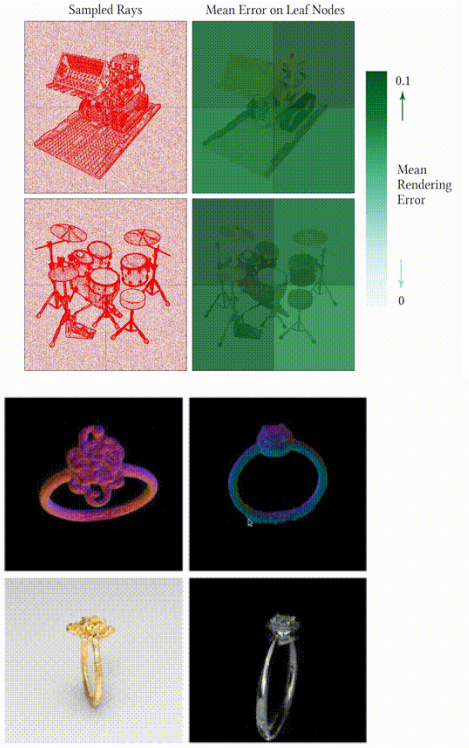


手绘草图重建

(TIP 2020)



辐射场渲染优化，高质量三维重建



- 手绘草图重建论文发表在TIP；
- 将神经辐射场NeRF的场景渲染提速**15%~40%**；将Plenoxels(CVPR 2022)提速约**22%**；
- 针对**三维珠宝重建**与深圳星坊科技公司签订技术**合同200万元**；

3D Gaussian Splatting

This video contains a voice-over

3D Gaussian Splatting for Real-Time Radiance Field Rendering

SIGGRAPH 2023
(ACM Transactions on Graphics)

Bernhard Kerbl*
Georgios Kopanas*
Thomas Leimkühler
George Drettakis

* Denotes equal contribution

GraphDeco
GRAPHics and Design with hEterogeneous COntent

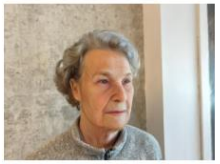
https://repo-sam.inria.fr/fungraph/3d-gaussian-splatting/

GaussianEditor




Turn the bear into a Grizzly bear.






Turn him into an old lady.

https://buaacyw.github.io/gaussian-editor/