SIYUAN YANG

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Education

Huazhong University of Science and Technology   Wuhan, China
BEng, Computer Science and Technology   *Degree anticipated in June 2025*
Double Major in Philosophy

My Interests

My research interests lie in the fields of 3D computer vision, computer graphics (rendering and geometry), and deep learning. I have research experience in point clouds segmentation within open-world scenarios and in enhancing geometry on 3D Gaussian splatting (3DGS).

I am eager to conduct research into 3D Vision, as well as exploring topics in inverse/differentiable rendering and generative 3D areas, leveraging foundation in related fields to bridge gaps in direct experience.

Publications & Manuscripts

PDF: A Probability-Driven Framework for Open World 3D Point Cloud Semantic Segmentation
Status: Accepted by CVPR 2024.
- We proposed a framework PDF for point cloud semantic segmentation in Open World problem.

3DGS Geometric Refinement with SDF
Status: Manuscript in preparation for submission to NeurIPS 2024.

Research Experience

3DGS Geometric Refinement with SDF   Jan. 2024 – Now
Advisor: Prof. Wei Yang
- Given the explosion of 3DGS works in 3D Vision area these days, we decided to use our knowledge of neural rendering to refine the geometry of 3DGS. We focused on incorporating both point cloud and SDF properties into our pipeline.
- This project has not completed yet, we are writing paper aiming for NeurIPS 2024.

SDF based layered BSDF & BSSRDF simulation in neural rendering   Oct. 2023 – Jan. 2024
Advisor: Prof. Wei Yang
- Inspired by the SDF properties and associated with layered BSDF, I conducted experiments to introduce more realistic rendering effects in neural rendering.
- Motivated by the limitations of layered BSDF's visual effects, I aim to develop a neural mapping algorithm that simulates the traditional BSSRDF method, taking a step forward in neural rendering.
- Upon discovering that other researchers just published a paper on Neural BSSRDF with promising results, we decided to pause this project to reassess its direction and without publication.

Open World 3D Point Cloud Semantic Segmentation   Oct. 2022 – Oct. 2023
Advisor: Prof. Xianzhi Li
- Explored open-set methods on 3D case's limitation, and inspired by 3D points' geometry knowledge, developed algorithms to identify object from uncertainty at point granularity.
- We proposed a framework, PDF, which utilizes a U-decoder to generate uncertainty of points and a pseudo-labeling scheme that proactively identifies the unknown area (HUA) and unknown object (GBD) to indicate the unknown.
- Conducted comprehensive comparative experiments across various datasets and backbones, achieving SOTA results. Demonstrates the robustness and effectiveness of our method.

Activities

Advances in Computer Graphics 2023   **University of Science and Technology of China**
                                                                                                         July 2023
- Participated in on-site cources and talkings

China 3DV 2024   **Shenzhen, China**
                                                                                                          Apr. 2024

Related Skills

Parallel programming, CUDA basics, Physically Based Rendering