

3D Model Segmentation Leveraging 2D Cues and Representations

Topic Description:

This thesis focuses on 3D Mesh Segmentation. The goal is to automatically split a 3D model into editable parts using only a limited number of rendered views.

The field of generative 3D modeling has been developing rapidly, with many high-quality methods emerging such as Trellis, Hunyuan3D, and Tripo. However, these methods typically generate a single, unified mesh, which is not convenient for later editing, retopology, or creating part-level datasets. Segmented models, on the other hand, are highly valuable in gaming, industrial design, animation, and as training data for 3D AI models.

Approach:

The work will build upon the mature experience from 2D segmentation models (e.g., SAM) and extend these ideas into 3D space to guide the segmentation process.

Main Challenges:

- Cross-view consistency – ensuring that the same part is segmented identically from different viewpoints.
- Balancing efficiency and accuracy.

