Deep Learning for Shape Reconstruction and Optimization
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Differentiable 3D Mesh Parameterization with Neural Networks

Mesh Representation for Aerodynamic Applications

Challenges in aerodynamic applications
- Creating computational meshes quickly, with high quality for simulation.
- Automating & eliminating heavy handcrafts.

We propose an auto-decoder model
- Encoding and fitting the target shape by deforming a fixed template mesh.
- Solving an elastic energy problem to refine the mesh quality.

Leveraging Geometric Primitives


HybridSDF [1]: Combination of Both

Improving Local Quality and Reality

Enabling Shape Manipulation

DeepSDF, Park et al., CVPR 2019
HierSQ, Paschalidou et al., CVPR 2020