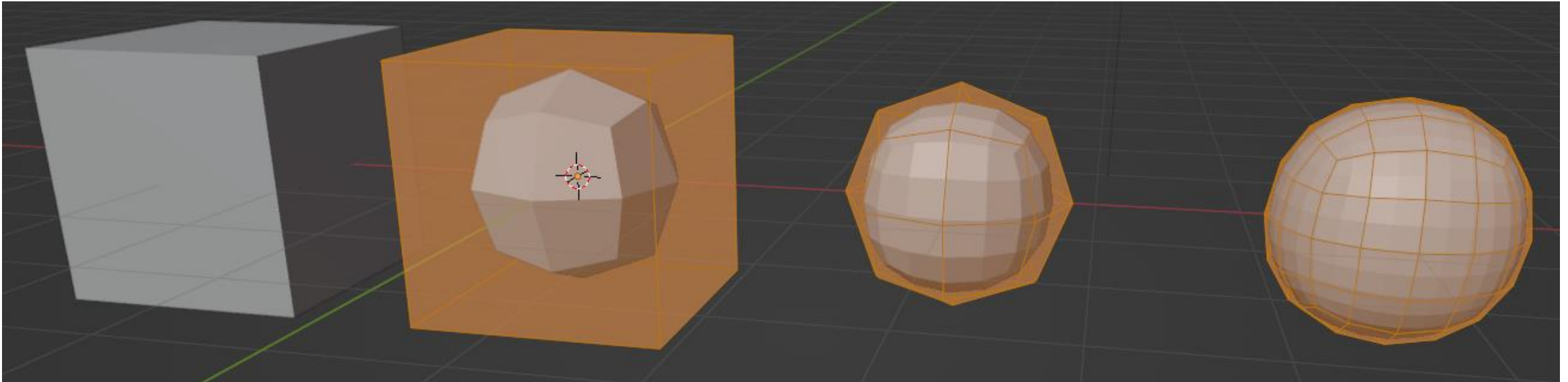


## Ray Tracing of Catmull-Clark Subdivision Surfaces by Tessellation

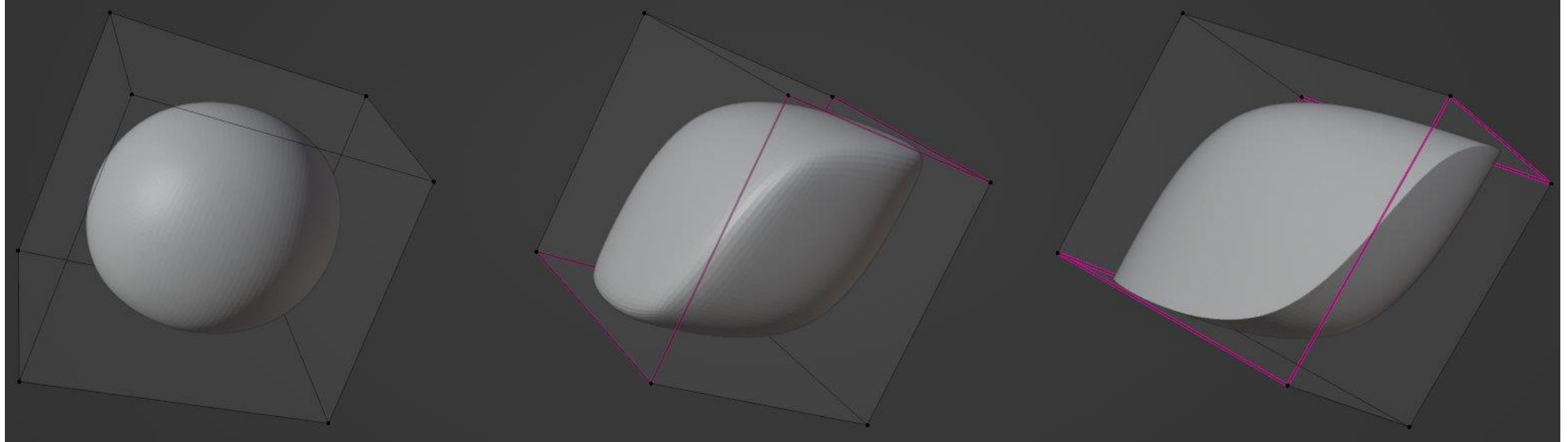
# Catmull-Clark Subdivision

## Tessellation



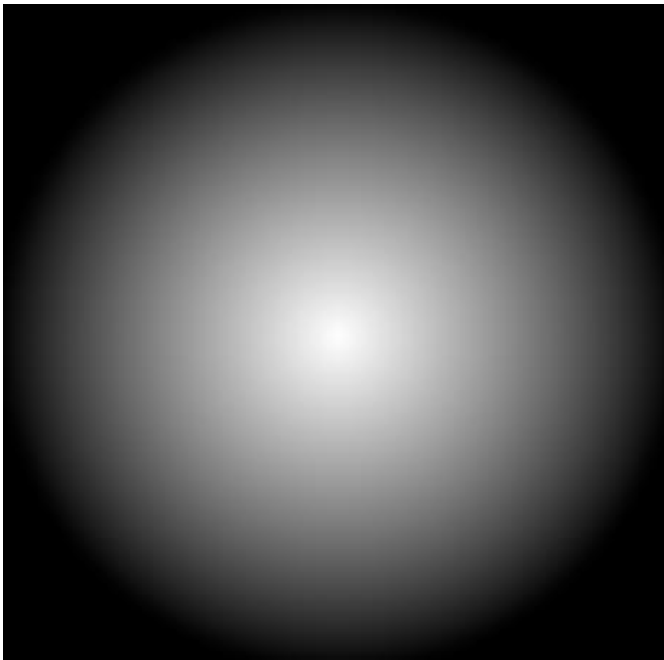
# Catmull-Clark Subdivision

## Sharp and Semi-sharp Creases

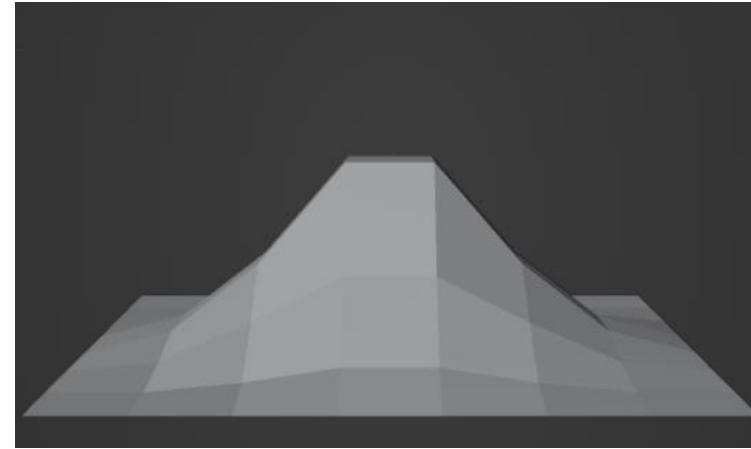


# Catmull-Clark Subdivision

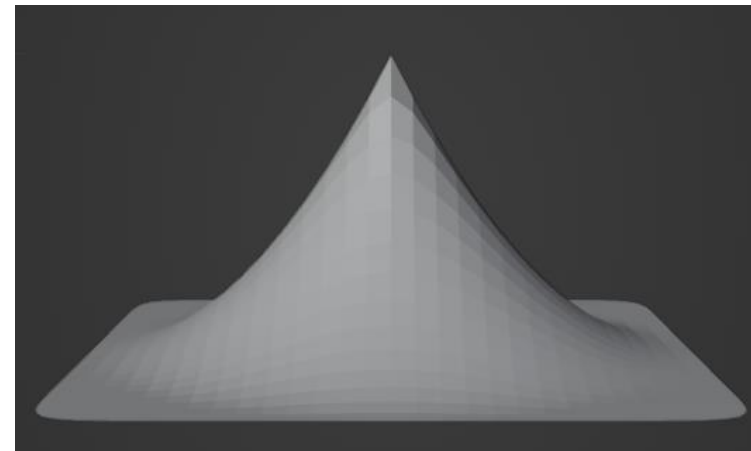
## Displacement Mapping



Displacement Map



Low Tessellation



High Tessellation



# Catmull-Clark Subdivision

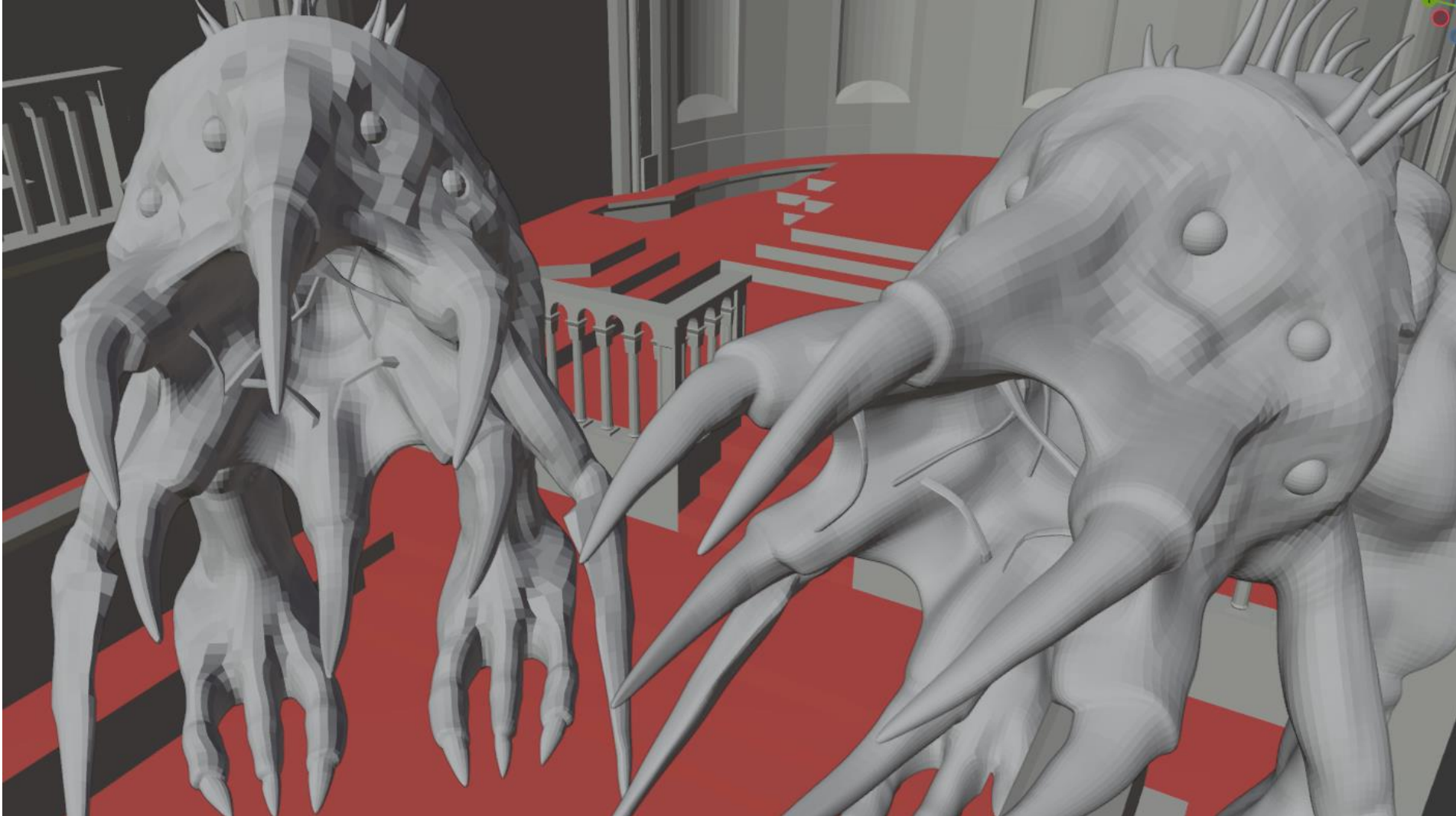
## Subdivide Texture Coordinates



Ray Traced Subdivided Knives

# Catmull-Clark Subdivision

Comparison in complex geometry





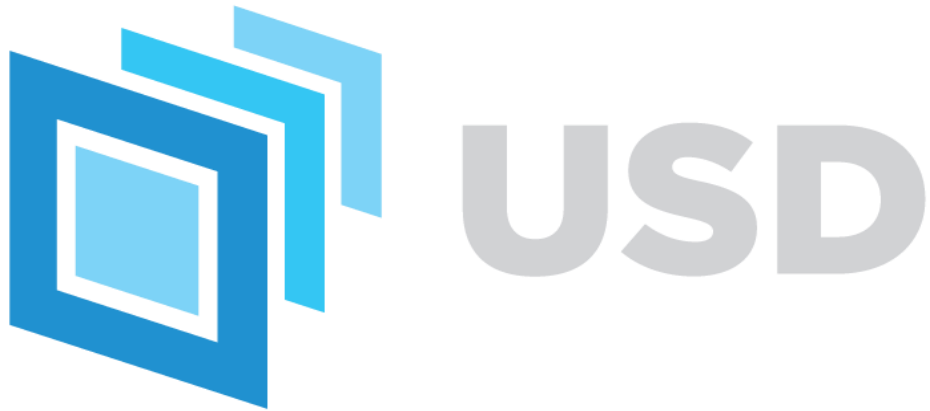
# Catmull-Clark Subdivision

| Comparison in complex geometry

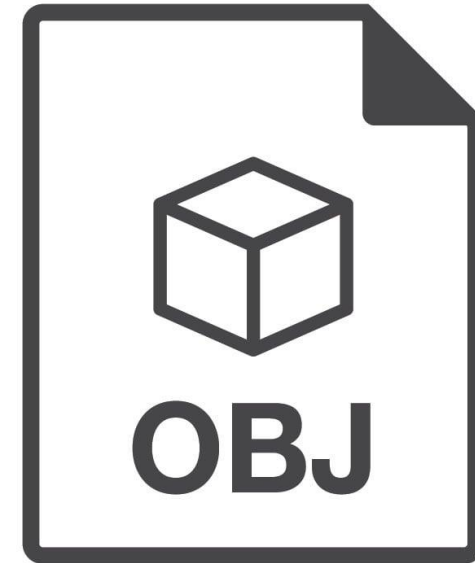


# File formats

## | Parser extended OBJ



Pixar's Universal Scene Description

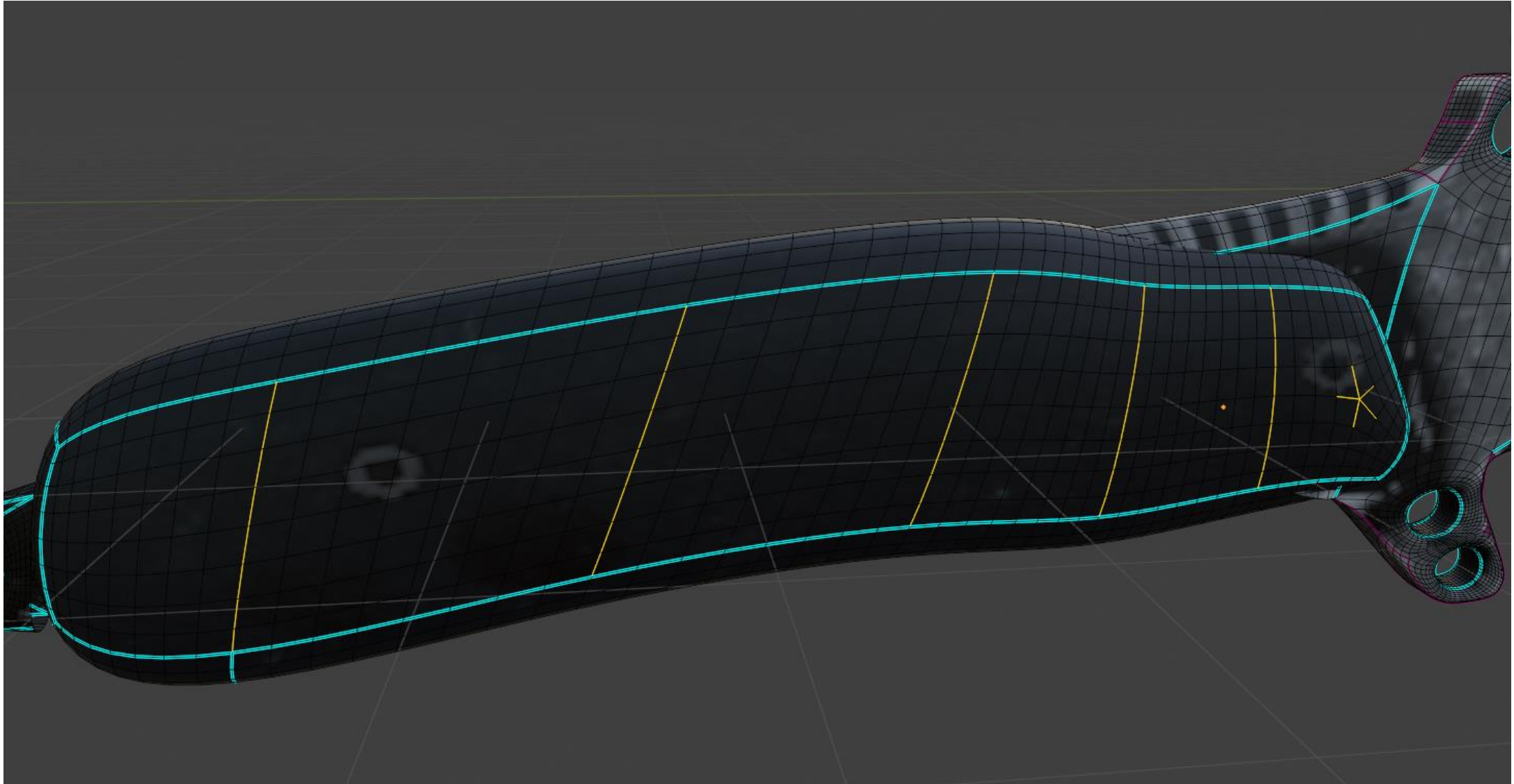


Wavefront OBJ Format



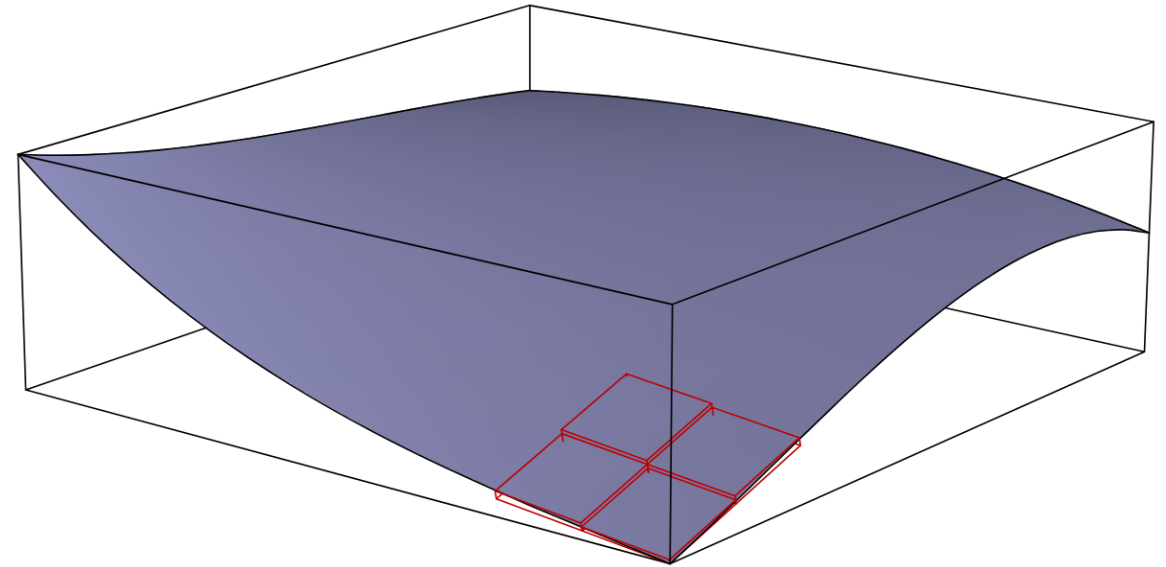
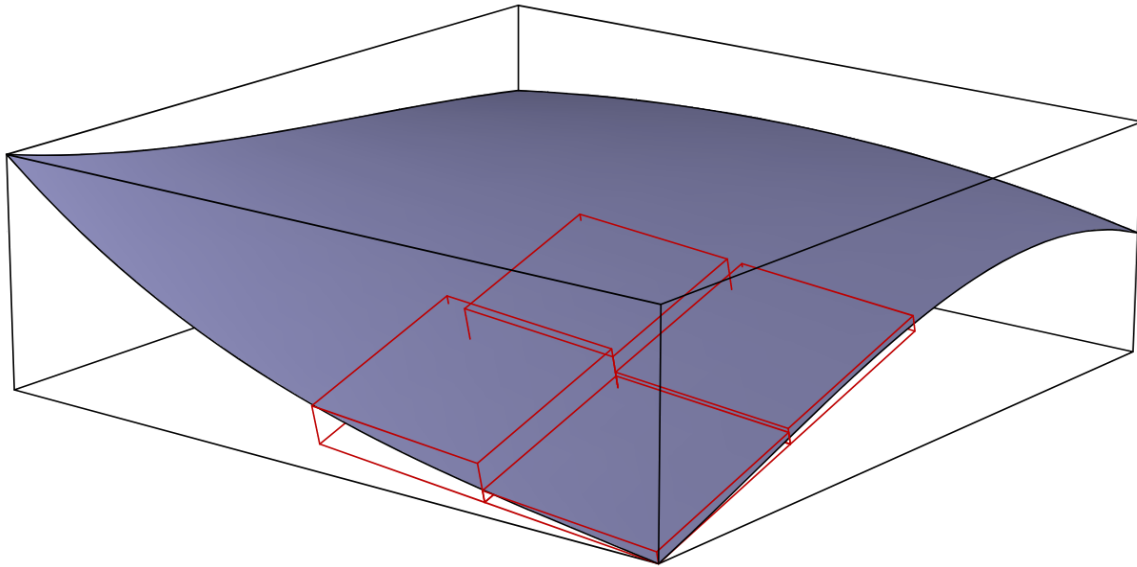
# Subdivision Enhancements

## Grid-Layout



# Subdivision Enhancements

## | Compression Scheme for Ray Tracing Subdivision Surfaces

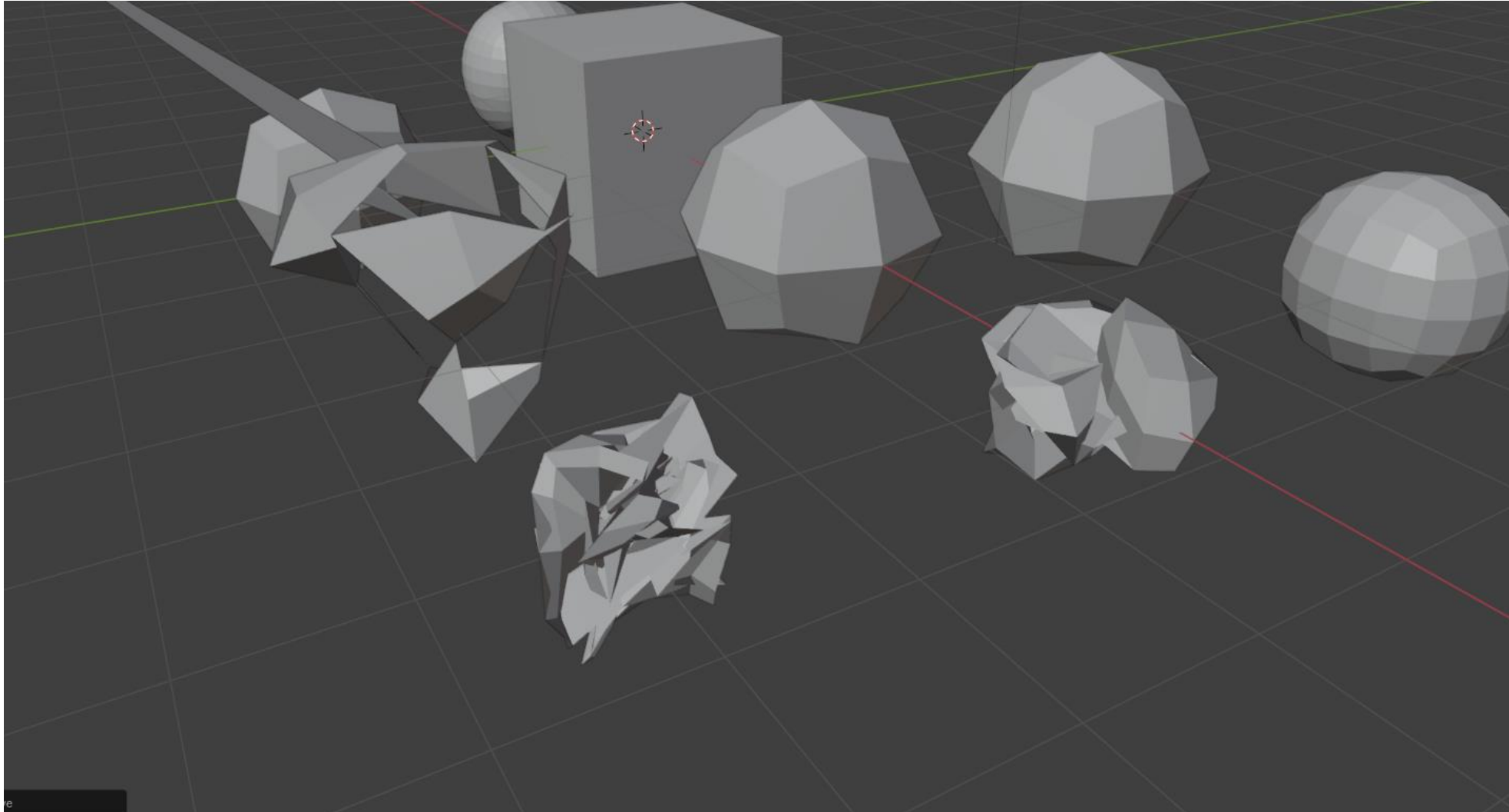


<https://dl.acm.org/doi/abs/10.1145/3233308>

**(A High-Resolution Compression Scheme for Ray Tracing Subdivision Surfaces with Displacement)**

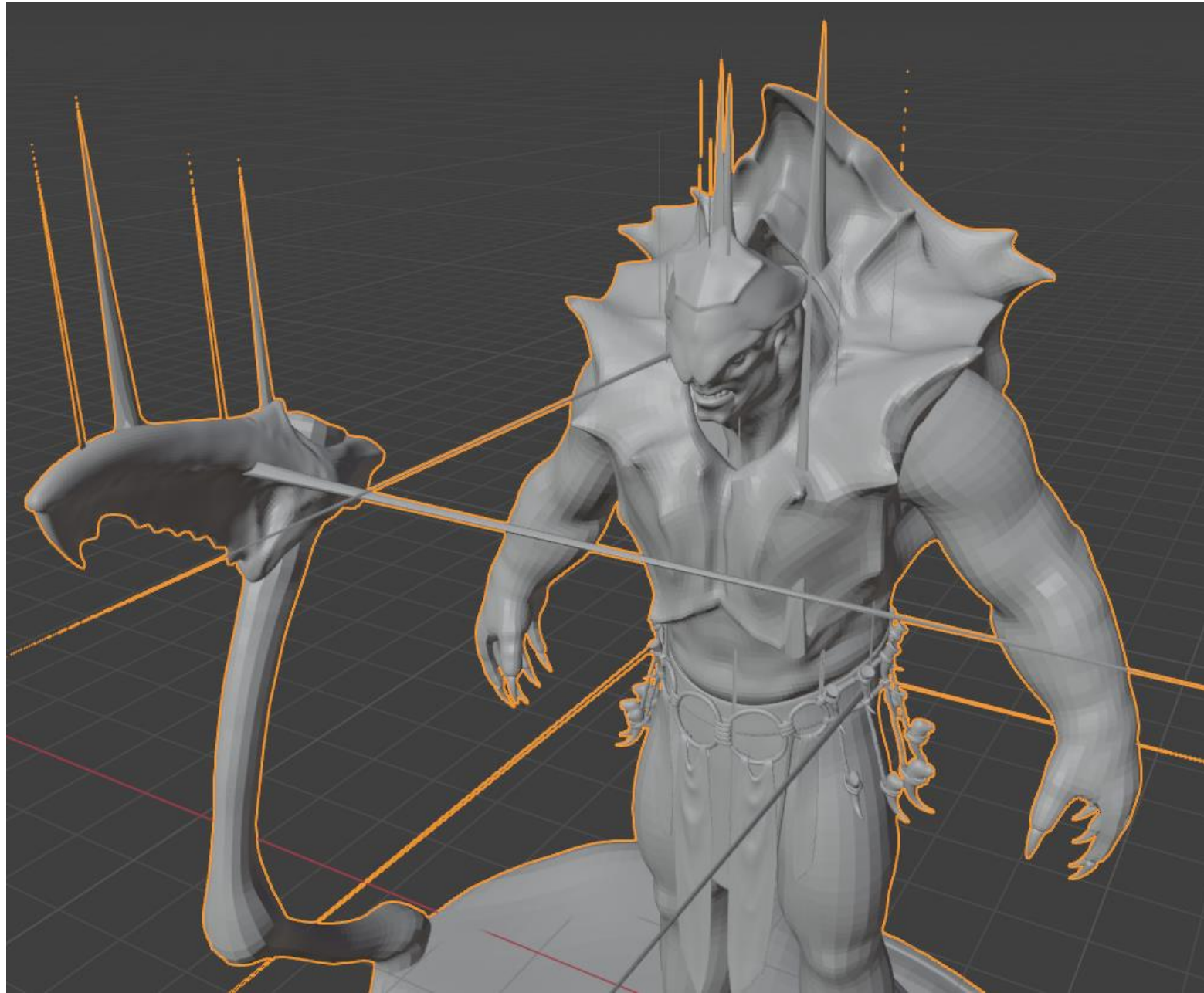
# Bloopers

## | Topology Hell



# Bloopers

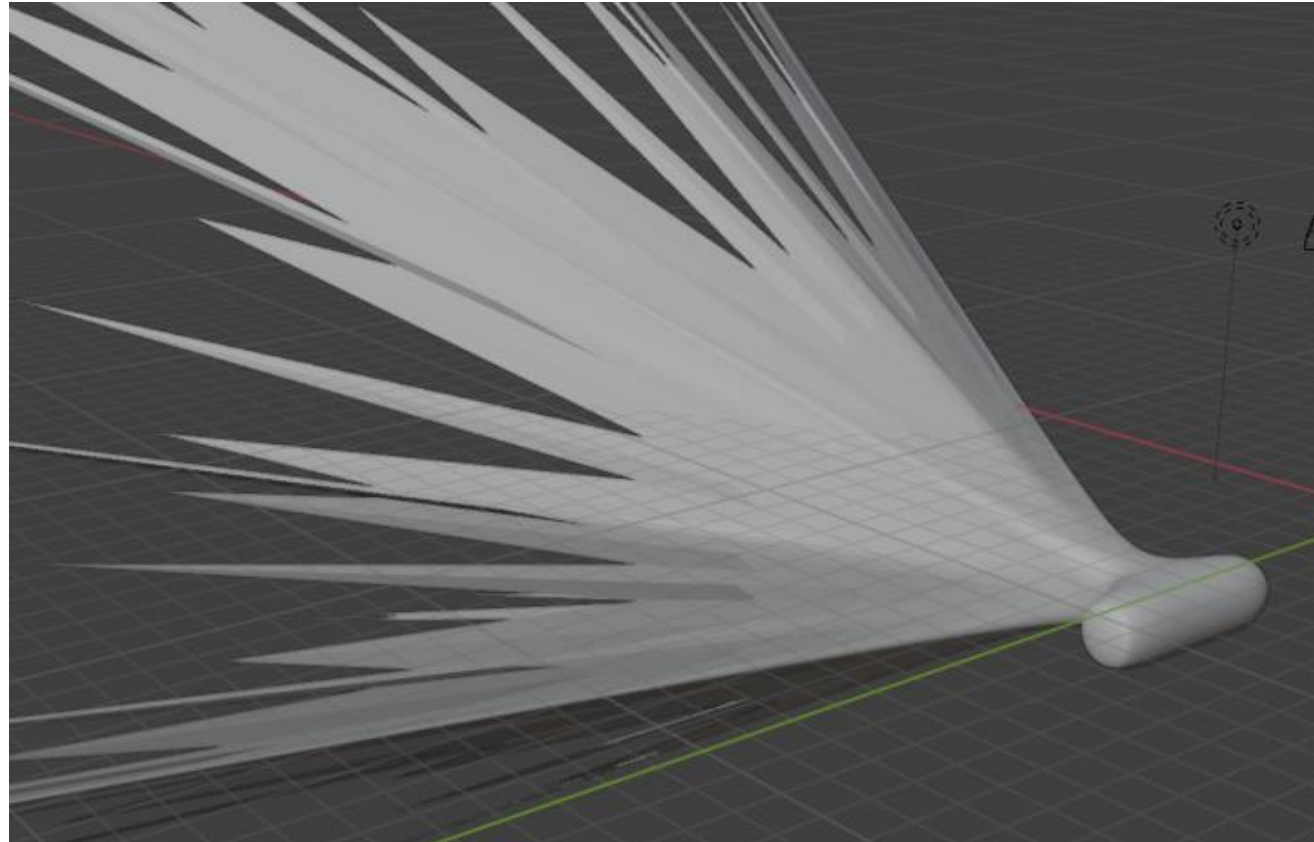
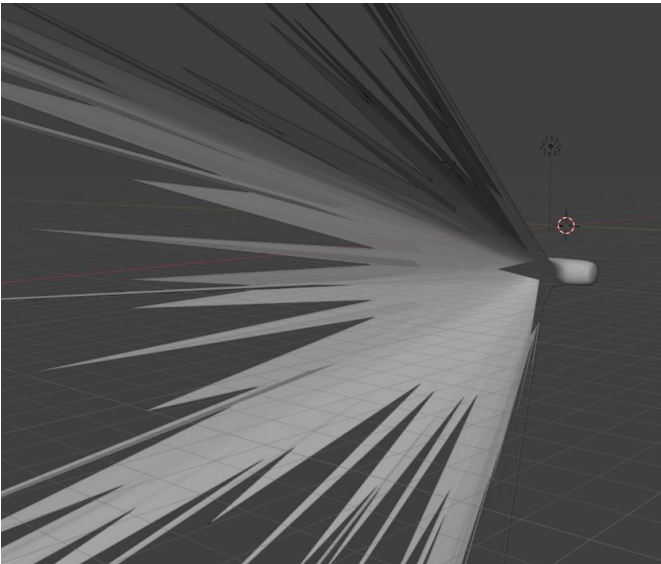
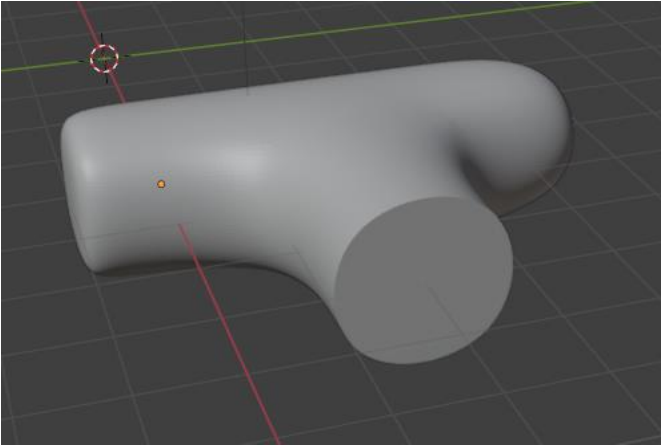
| Spikey





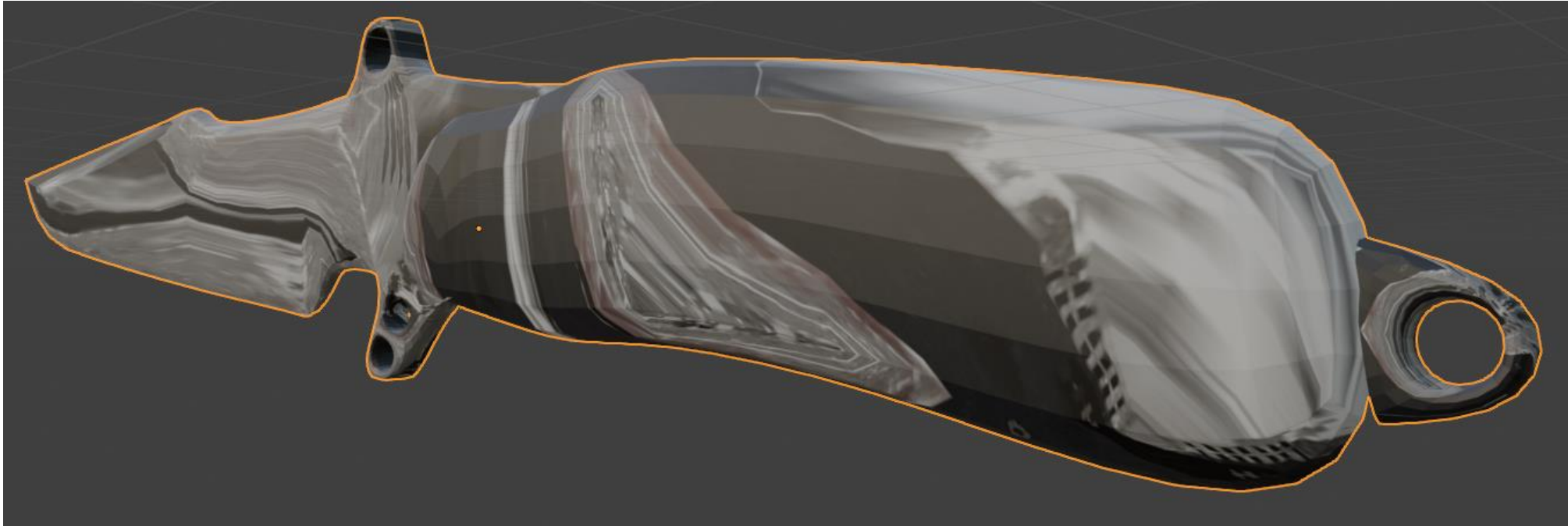
# Bloopers

## | Crease explosion



# Bloopers

## | Fancy Knives



- <https://openusd.org/docs/api/index.html>
- <https://cgifurniture.com/3d-file-format-10-types/>
- <https://dl.acm.org/doi/abs/10.1145/3233308>