

## Mesh Simplification

### Lecture 14

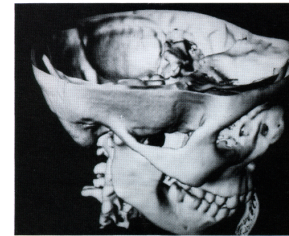


Figure 5a. Full resolution (569k Gouraud shaded triangles).

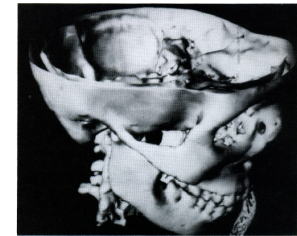


Figure 5b. 75% decimated (142k Gouraud shaded triangles).

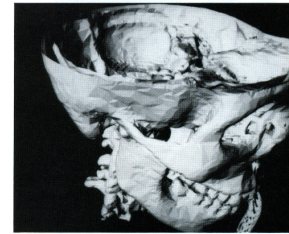


Figure 5c. 75% decimated (142k flat shaded triangles).

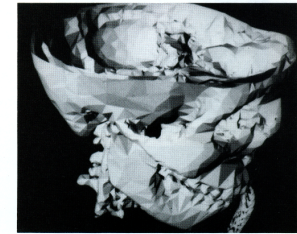


Figure 5d. 90% decimated (57k flat shaded triangles).

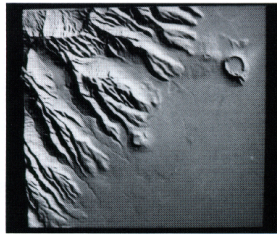


Figure 7a. 32% decimated (276k Gouraud shaded triangles).

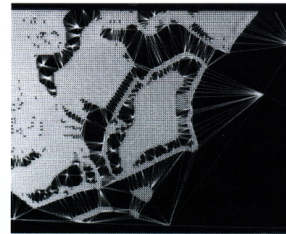


Figure 7b. 32% decimated, shore line detail.

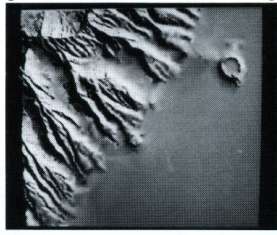


Figure 7c. 90% decimated (40k Gouraud shaded triangles).

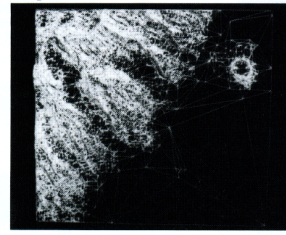
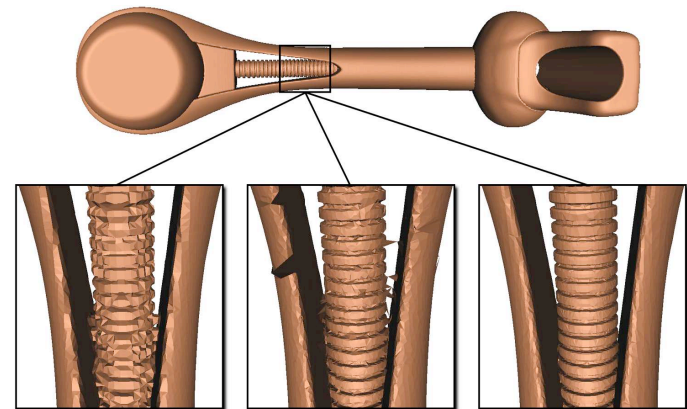


Figure 7d. 90% decimated (40k wireframe).



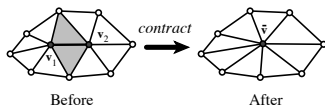


Figure 1: **Edge contraction.** The highlighted edge is contracted into a single point. The shaded triangles become degenerate and are removed during the contraction.

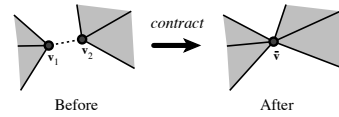


Figure 2: **Non-edge contraction.** When non-edge pairs are contracted, unconnected sections of the model are joined. The dashed line indicates the two vertices being contracted together.



Figure 4: A sequence of approximations generated using our algorithm. The original model on the left has 5,804 faces. The approximations to the right have 994, 532, 248, and 64 faces respectively. Note that features such as horns and hooves continue to exist through many simplifications. Only at extremely low levels of detail do they begin to disappear.

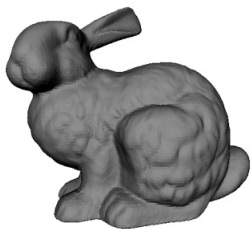


Figure 8: Original bunny model with 69,451 triangles. Rendered using flat shading just as in approximations below.

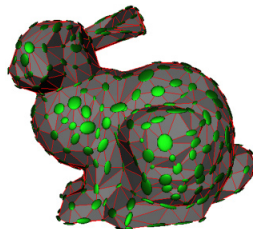


Figure 11: 1,000 face approximation. Error ellipsoids for each vertex are shown in green.