Mesh Modelling
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• 3D objects can be represented using meshes

• A triangle mesh consists of vertices and triangular faces, we can:
  – Render meshes in different ways
  – Compute properties such as normal

• Today: mesh editing
Mesh Smoothing

- Laplacian smoothing: each vertex moves to the average of its neighbors

\[ v_i = \frac{1}{N} \sum_{v_j \in \text{adj}(v_i)} v_j \]

Can be a weighted average
Editing Selected Vertex

• What is the expected result if a user wants to move a “point” on a mesh in the normal direction?
• If we only change the position of the nearest vertex:
Editing Selected Vertex

- What is the expected result if a user wants to move a “point” on a mesh in the normal direction?
- The action can affect a larger neighborhood of the selected vertex:
Editing Selected Vertex

- Each vertex $v$ in the vicinity of $p$ is translated by $w(v)\vec{n}(v)$
- The weight $w(v)$ depends on the distance between $v$ and $p$