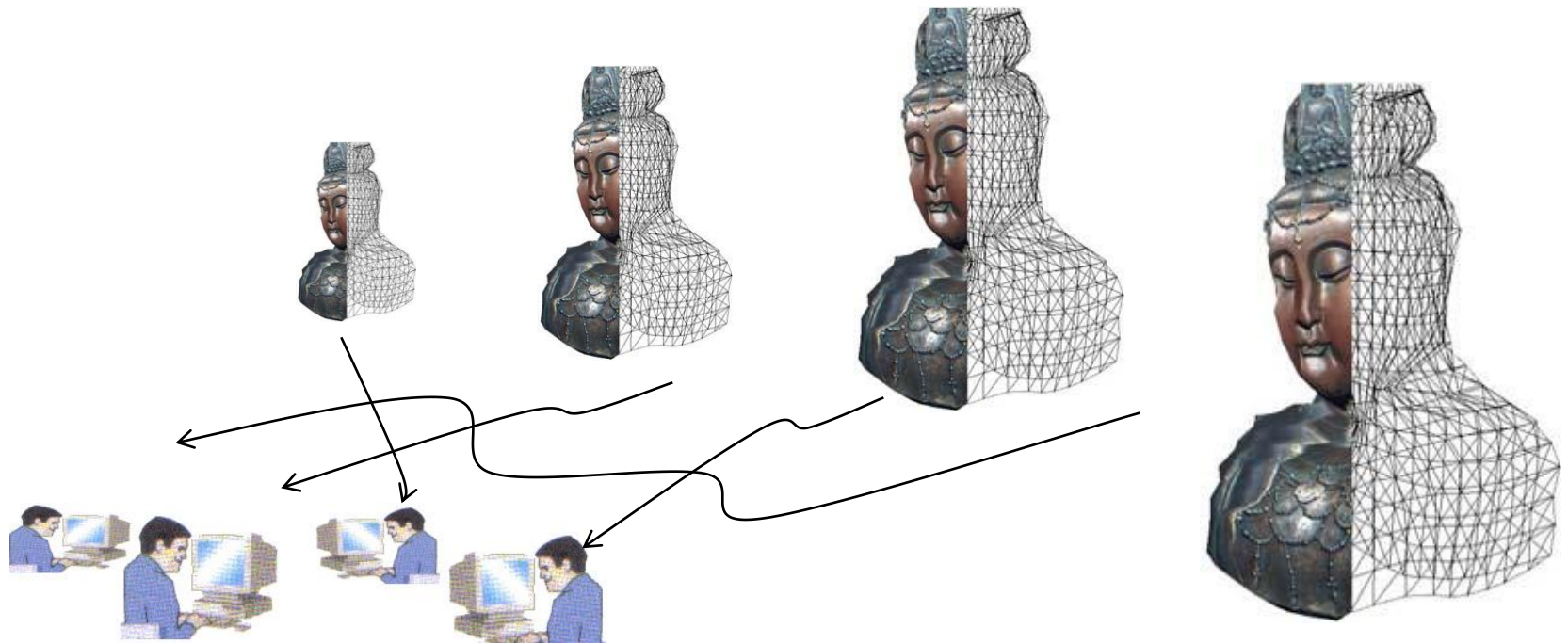


Complexity & Theoretical Issues for Progressive Meshes

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Complexity of Updating Costs after each step

- The Priority Queue used to store costs associated with simplification can be stored using a Min Heap data structure.
- Constant cost to extract the Minimum from a Heap.
- Cost to insert a New Element into a Heap is $O(\log n)$ if n is the total number of element.
- Thus each step during simplification has $O(\log n)$ complexity.

$$E_{\text{dist}}$$

- Tries to keep simplified mesh surface close to the surface of the original mesh.
- This term gets bigger the farther the simplified mesh vertices are from the original surface.

$$E_{\text{spring}}$$

- This term tries to create Balanced Triangles, rather than long thin triangles.
- The best case is when triangles are equilateral.
- If we consider all triangles with a given area A , say; then the sum of the squares of the 3 sides is minimized when the triangle has all sides equal.