Laplacian smoothing

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This article is about the mesh smoothing algorithm. For the multinomial shrinkage estimator, also called Laplace smoothing *or* add-one smoothing*, see additive smoothing.*

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Laplacian smoothing is an algorithm to smooth a polygonal mesh.[1][2] For each vertex in a mesh, a new position is chosen based on local information (such as the position of neighbors) and the vertex is moved there. In the case that a mesh is topologically a rectangular grid (that is, each internal vertex is connected to four neighbors) then this operation produces the Laplacian of the mesh.

More formally, the smoothing operation may be described per-vertex as:

$$\bar{x}_i = \frac{1}{N}\sum_{j=1}^{N} \bar{x}_j$$

Where N is the number of adjacent vertices to node i, $\bar{x}_j$ is the position of the j-th adjacent vertex and $\bar{x}_i$ is the new position for node i.[3]

See also [edit]

- Tutte embedding, an embedding of a planar mesh in which each vertex is already at the average of its neighbors' positions

References [edit]

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