Optimally Representing Euclidean Space Discretely for Analogically Simulating Physical Phenomena

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Abstract

We are interested in the *literal, analogical* simulation of physical phenomena using a mesh connected computer. We would like to model physical spaces discretely by mesh(-like) massively parallel computers (with local connectivity only). Here's the point of that. Each processor in such a mesh represents a point in the space and each path built of a succession of immediate connections in the mesh represents a path in the space. Physical motion of tangible or intangible "objects" can be simulated by algorithmically passing, in the mesh, *fragments* of the objects from simulated point to adjacent simulated point in much the same way as the actual fragments of objects passing from point to point in real spaces constitutes the real motion of those objects. In a mesh those fragments could/would just be the algorithms governing how they are to be passed around.

In *this* paper, we deal with the issue of discretely representing euclidean space *well* for our purposes.

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