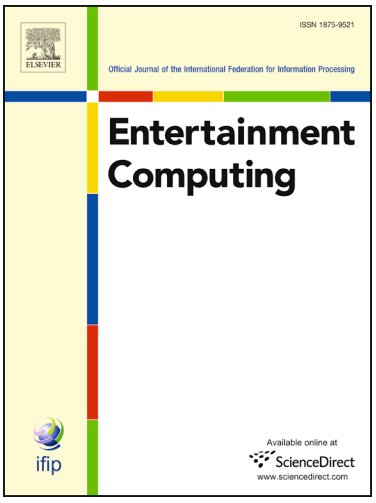

Localized Constraint Based Deformation Framework For Triangle Meshes

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Localized Constraint Based Deformation Framework For Triangle Meshes

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Abstract

Traditional Verlet integration frameworks have been successful with their robustness and efficiency to simulate deformable bodies ranging from simple cloth to geometrically complex solids. However, the existing frameworks deform the models as a whole. We present a Verlet integration framework which provides local surface deformation on the arbitrary selected area of the mesh without giving any global deformation impact to the whole model. The framework is designed to take the advantage of physics to deform simple triangle meshes with the position-based approach. Our framework provides an interactive selection of the deformation influence area by using geodesic distance computation based on *heat kernel*. Additionally, the framework computes several geometric constraints that provides an interconnected particle system simulation with environmental interactions such as collision. The proposed framework is robust and easy to implement since it is based on highly accurate geodesic distance computation and solving the projected geometric constraints. We demonstrate the benefits of our framework with the results obtained from various triangle mesh models to present its potential in terms of practicability and effectiveness.

Keywords: Physically-based modeling/animation, Deformable bodies, Mesh deformation, Geodesic distance

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