

Shape Inflation With an Adapted Laplacian Operator For Hybrid Quad/Triangle Meshes

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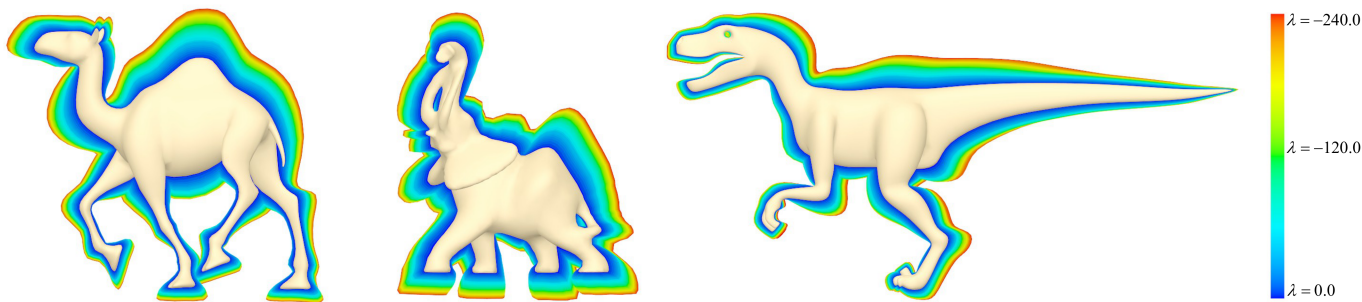


Fig. 1. A set of 48 successive shapes enhanced, from $\lambda = 0.0$ in blue to $\lambda = -240.0$ in red, with steps of -5.0 .

Abstract—This paper proposes a novel modeling method for a hybrid quad/triangle mesh that allows to set a family of possible shapes by controlling a single parameter, the global curvature. The method uses an original extension of the Laplace Beltrami operator that efficiently estimates a curvature parameter which is used to define an inflated shape after a particular operation performed in certain mesh points. Along with the method, this work presents new applications in sculpting and modeling, with subdivision of surfaces and weight vertex groups. A series of graphics examples demonstrates the quality, predictability and flexibility of the method in a real production environment with software Blender.

Keywords—laplacian smooth; curvature; sculpting; subdivision surface

[12]. Nevertheless these methods are difficult to deal with since they require a large number of parameters and a very tedious customization. Instead, the presented method requires a single parameter that controls the global curvature, which is used to maintain realistic shapes, creating a family of different versions of the same object and therefore preserving the detail of the original model and a realistic appearance.

Interest in meshes composed of triangles and quads has lately increased because of the flexibility of modeling tools such as Blender 3D [13]. Nowadays, many artists use a manual connection of a couple of vertices to perform animation processes and interpolation [14]. It is then of paramount