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SwingWrapper: Retiling triangle meshes for better EdgeBreaker compression

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Author(s): Attene M, Falcidieno B, Spagnuolo M, Rossignac J

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Abstract: We focus on the lossy compression of manifold triangle meshes. Our SwingWrapper approach partitions the surface of an original mesh M into simply connected regions, called triangloids. From these, we generate a new mesh M'. Each triangle of M' is an approximation of a triangloid of M. By construction, the connectivity of M' is fairly regular and can be compressed to less than a bit per triangle using EdgeBreaker or one of the other recently developed schemes. The locations of the vertices of M' are compactly encoded with our new prediction technique, which uses a single correction parameter per vertex. SwingWrapper strives to reach a user-defined output file size rather than to guarantee a given error bound. For a variety of popular models, a rate of 0.4 bits/triangle yields an L-2 distortion of about 0.01% of the bounding box diagonal. The proposed solution may also be used to encode crude meshes for adaptive transmission or for controlling subdivision surfaces.

Document Type: Article

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Author Keywords: algorithms; triangle mesh; geometry compression; simplification; retiling; remeshing

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