

Abstract: Displaced Butterfly Subdivision Surface Reconstruction from Point Clouds Using MLS Approximation

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Abstract

This paper proposes a new procedure for generating a displaced butterfly subdivision surface for approximating arbitrary point cloud data taken from surfaces of any topology. The subdivision surface is able not only to represent a natural level of detail structure of the surface, but it is also to be memory-efficient by taking advantage of smoothness properties. We use a variant displaced subdivision scheme, where scalar displacements, in the direction of a local normal, are computed via the MLS (moving-least-squares) approach. The scalar displacement values represent the details of a subdivision surface. The resulting surface is a mesh with subdivision connectivity providing a high quality and efficient approximation of the given point clouds. At last, we present several examples demonstrating the performance of our algorithm.

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