

Multiresolution lattice-based support generation for additive manufacturing

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Abstract

The generation of support for 3D models toward 3D printing is a highly challenging task that is of great need in many additive manufacturing processes. In this work, we explore the use of multiresolution geometric lattices to generate support with controlled contact locations. That is, with bounds on the maximal distance between adjacent local support points. A variety of end-user controls over the synthesized support are provided, such as the angular slopes in the model that are provided with support and/or controls on the dimensions and sizes of the support lattice tiles. These controls are augmented with the option of an automated optimization via a direct link to analysis. We demonstrate this proposed lattice approach for support synthesis on several 3D models of different types.

Keywords:

Hierarchical lattices Porous geometry 3D printing 3D models