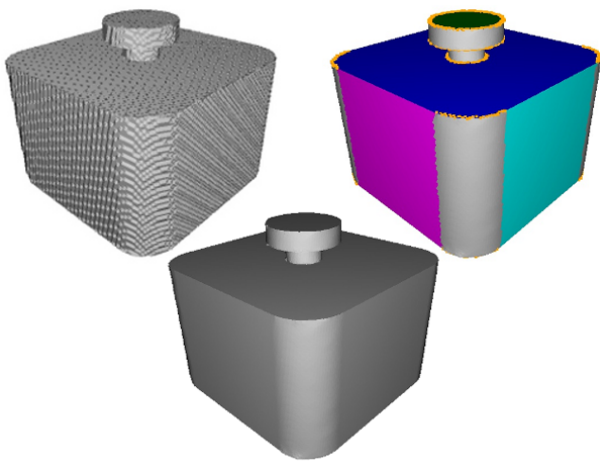


Pressing: Smooth Isosurfaces with Flats from Binary Grids

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We present "Pressing", an algorithm for smoothing isosurfaces extracted from binary volumes while recovering their large planar regions (flats). Pressing yields a surface that is guaranteed to contain the samples of the volume classified as interior and exclude those classified as exterior. It uses global optimization to identify flats and constrained bilaplacian smoothing to eliminate sharp features and high-frequencies from the rest of the isosurface. It recovers sharp edges between flat regions and between flat and smooth regions. Hence, the resulting isosurface is usually

a much more accurate approximation of the original solid than isosurfaces produced by previously proposed approaches. Furthermore, the segmentation of the isosurface into flat and curved faces and the sharp/smooth labelling of their edges may be valuable for shape recognition, simplification, compression, and various reverse engineering and manufacturing applications.