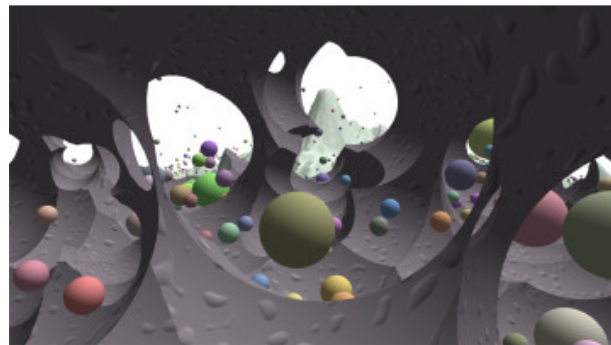


# Real-time rendering and physics of complex dynamic terrains modeled as CSG trees of DEMs carved with spheres

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We present a novel proposal for modeling complex dynamic terrains that offers real-time rendering, dynamic updates and physical interaction of entities simultaneously. We can capture any feature from landscapes including tunnels, overhangs and caves, and we can conduct a total destruction of the terrain. Our approach is based on a Constructive Solid Geometry tree, where a set of spheres are subtracted from a base Digital Elevation Model. Erosions on terrain are easily and efficiently carried out with a spherical sculpting tool with pixel-perfect accuracy. Real-time rendering performance is achieved by applying a



one-direction CPU↔GPU communication strategy and using the standard depth and stencil buffer functionalities provided by any graphics processor.