

Title: *Four Open Mathematical Problems Related to Computer Graphics and Geometric Modeling*

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Abstract: Four unsolved problems that originate from research in Computer Graphics and Geometric Modeling will be presented. The first problem involves understanding the notion oscillation for Bezier surfaces, the freeform polynomial surfaces most common in Computer Graphics and Geometric Modeling. The second problem concerns generating smooth (C^2) surfaces via subdivision from triangular or quadrilateral meshes of arbitrary topology. The third problem is related to Bezier curves and univariate Bernstein polynomials, and concerns the combinatorics of symmetrizing multiaffine functions. The fourth and final problem pertains to fractals and asks if there is an algorithm to determine whether two arbitrary sets of contractive affine transformations generate the same fractal.