A Brief History of Subdivision Methods and an Outlook to Future Challenges

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Subdivision methods are essential in computer graphics and geometry processing as they provide a very efficient and intuitive way of designing curves and surfaces. The main idea of these methods is to iteratively refine a coarse control polygon or control mesh by adding new vertices, edges, and faces. This process generates a sequence of polygons or meshes with increasingly smaller edges which converges to a smooth curve or surface under certain conditions. In practice, few iterations of this refinement process suffice to generate curves and surfaces that appear smooth at screen resolution. This survey presentation summarizes the highlights from 40 years of subdivision history and points out several open problems and challenges for future research.