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AI-Assisted Subdivision Scheme for Enhanced Smooth Surface Generation

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Abstract

Subdivision schemes are widely used in geometric modeling to generate smooth surfaces from coarse meshes. Classical methods provide strong theoretical foundations for surface refinement and arbitrary topology design [2,3,4], while recent studies have explored improved shape control and flexibility [1,5]. However, achieving realistic geometric representation remains challenging.

This work introduces an AI-assisted subdivision scheme aimed at improving surface smoothness and geometric realism while preserving the fundamental properties of traditional approaches. The proposed framework enhances visual quality and reduces geometric artifacts, enabling better approximation of complex shapes. The results demonstrate the potential of artificial intelligence to advance subdivision techniques in computer graphics and geometric modeling.

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