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Combining improvement and refinement techniques: 2D Delaunay mesh adaptation under domain changes

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We propose a framework that combines improvement and Delaunay refinement techniques for incrementally adapting a refined mesh by interactively inserting and removing domain elements. Our algorithms achieve quality mesh by deleting, moving or inserting Steiner points from or into the mesh. The modifications applied to the mesh are local and the number of Steiner points added during the mesh adaptation process remains low. Moreover, since a mesh generation process can be viewed as an adaptation mesh process when domain elements are inserted one by one, our approach can also be applied to the generation of refined Delaunay quality meshes by incorporating our framework in the main body of Delaunay refinement mesh generation algorithms.

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