

Optimization of piecewise-smooth shapes as optimization on a Riemannian product manifold

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While the space of infinitely-smooth shapes as a Riemannian manifold has already been frequently used for the theoretical analysis of shape optimization algorithms, numerical experiments have indicated that it also works for non-smooth shapes. However, the lack of a shape space that contains non-smooth shapes but still inherits a Riemannian manifold structure has made a theoretical investigation difficult. In this presentation, we will introduce a shape space based on a Riemannian product manifold that can be used to optimize piecewise-smooth shapes. Furthermore, we show numerical experiments that yields non-smooth shapes as an optimization result.