Shape optimization with Lipschitz methods

Michael Hinze[1]

We present a general shape optimisation framework based on the method of mappings in the Lipschitz topology. We propose steepest descent and Newton-like minimisation algorithms for the numerical solution of the respective shape optimisation problems. Our work is built upon previous work of the authors in (Deckelnick, Herbert, and Hinze, ESAIM: COCV 28 (2022)), where a Lipschitz framework for star-shaped domains is proposed. To illustrate our approach we present a selection of PDE constrained shape optimisation problems and compare our findings to results from so far classical Hilbert space methods and recent p-approximations. We also provide numerical convergence analysis.

[1]Universität Koblenz
hinze@uni-koblenz.de