INGREDIENTS FOR EFFICIENT AERODYNAMIC ONE-SHOT SHAPE OPTIMIZATION

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ABSTRACT

Different one-shot optimization methods (a continuous as well as a discrete one) for aerodynamic shape design problems will be presented. These methods enable aerodynamic shape designs for the computational effort of a small, constant multiple of the effort of an aerodynamic simulation. Integral part of these approaches are suitable preconditioners for the coupled one-shot loop, gradient smoothing and shape derivatives. Furthermore, we discuss how to treat constraints in the context of one-shot methods. Finally, several validation and demonstration cases for the presented one-shot approaches will be shown.

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