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*“Recent Techniques in Algorithmic Shape Optimization”*

Shape Optimization aims at finding optimal shapes, which is a highly important topic in many fields of application. The algorithmically oriented branch of this research aims at devising specific optimization algorithms taking into account structures arising in PDE constrained shape optimization problems. Here, gradient descent techniques can be greatly accelerated by analysing shape Hessians resulting in efficient approximations. Furthermore, a recent generalized variant of the shape calculus allows for large shape deformations without sacrificing tangential mesh quality. These recent developments are discussed together with their relation to specific applications.