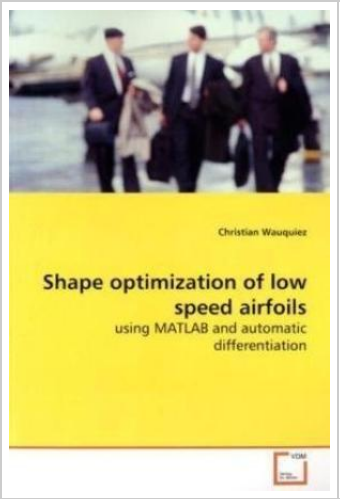

Shape optimization of low speed airfoils

By christian wauquiez

VDM Verlag Apr 2009, 2009. Taschenbuch. Book Condition: Neu. 220x152x10 mm. Neuware - An innovative tool for shape optimization of low speed airfoils was developed by the author at KTH, in 1997-2000. The tool is written in Matlab, and is constructed by coupling the Matlab Optimization Toolbox with a parametrised numerical aerodynamic solver. The airfoil shape is expressed analytically as a function of some design parameters. The NACA 4 digits library is used with design parameters that control the camber and the thickness of the airfoil. The solver has to provide fast and robust computation of the lift, pitching moment and drag of an airfoil placed in a low-speed viscous flow. A one- way coupled inviscid - boundary layer model is used. The derivatives of these results are also computed by the solver. This was done by automatic differentiation, a technique for augmenting computer programs with the computation of derivatives based on the chain rule of differential calculus. Finally as an application, sample optimization problems are solved and the resulting optimal airfoils are analysed. 68 pp. Englisch.

Reviews

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